

FIG. 1

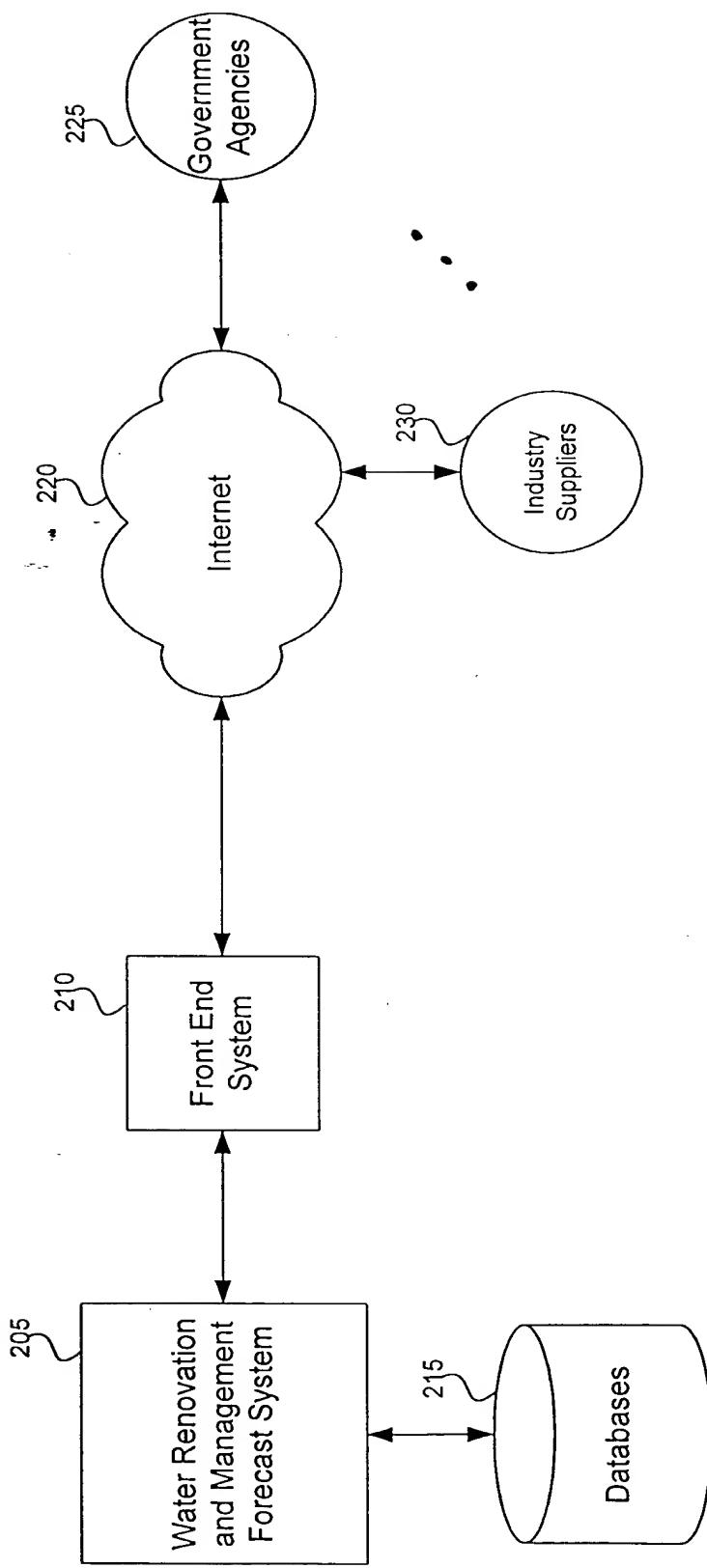


FIG. 2

Water Renovation and Management Forecast System 205

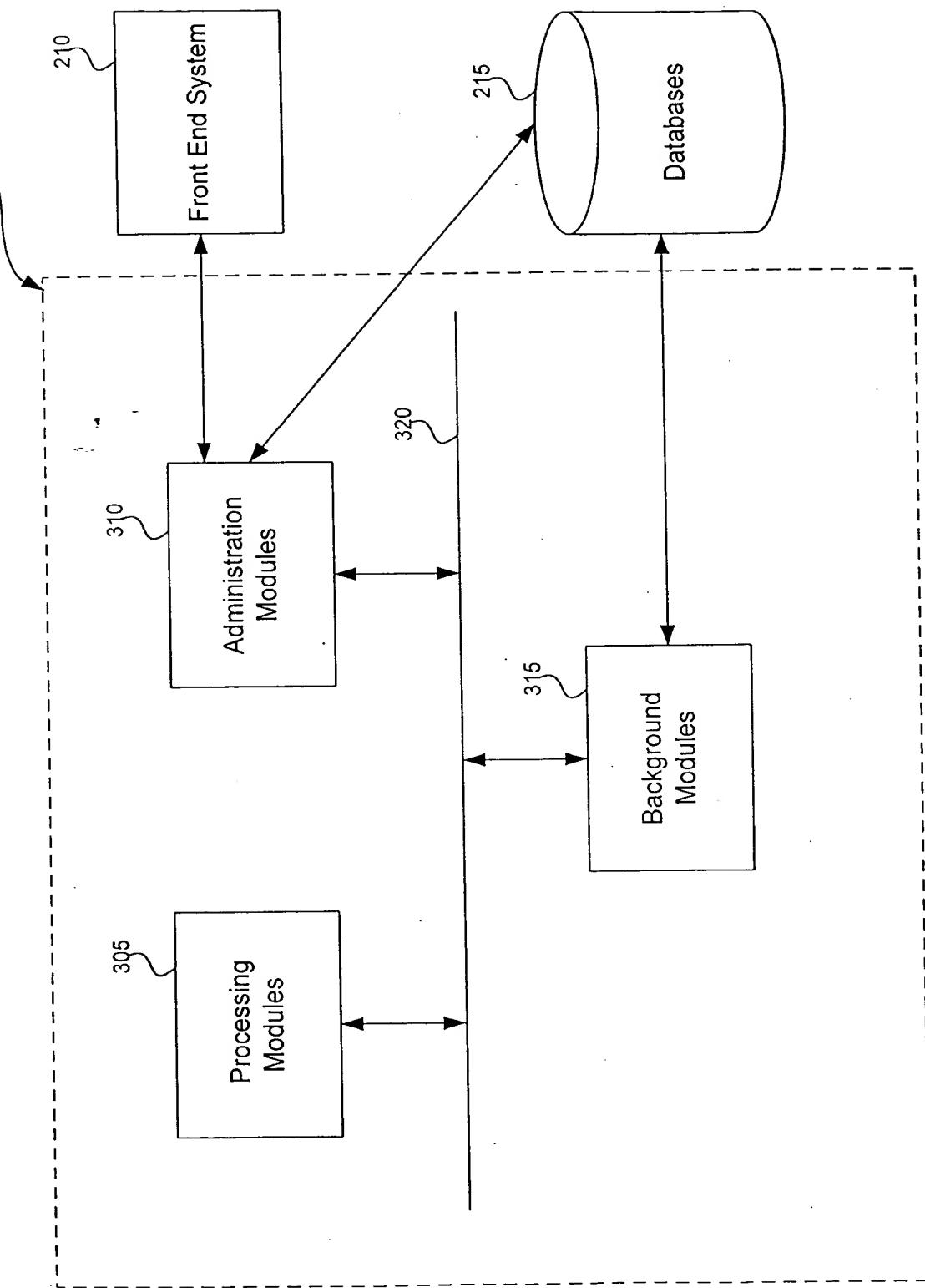


FIG. 3

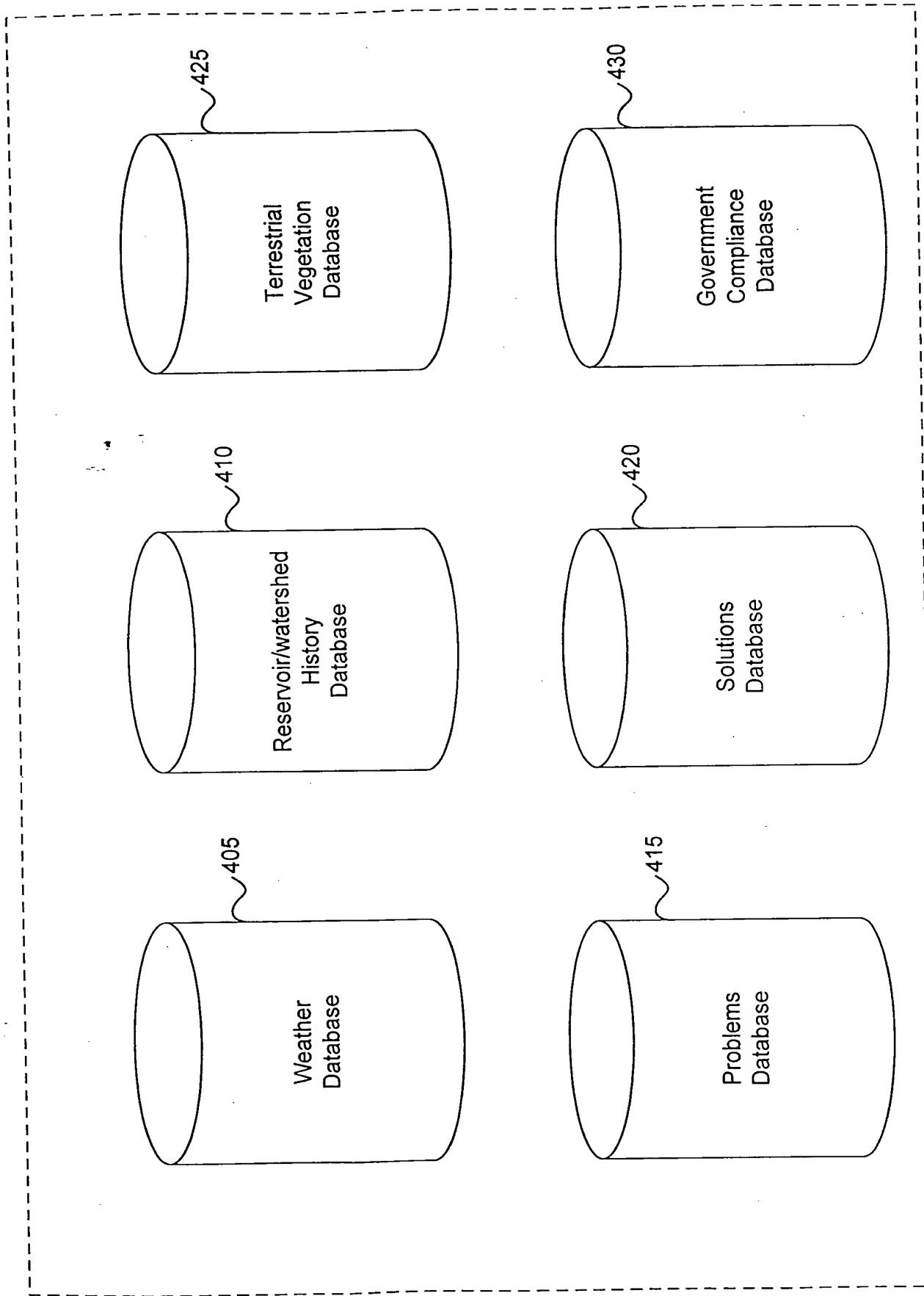


FIG. 4

Weather Database 405

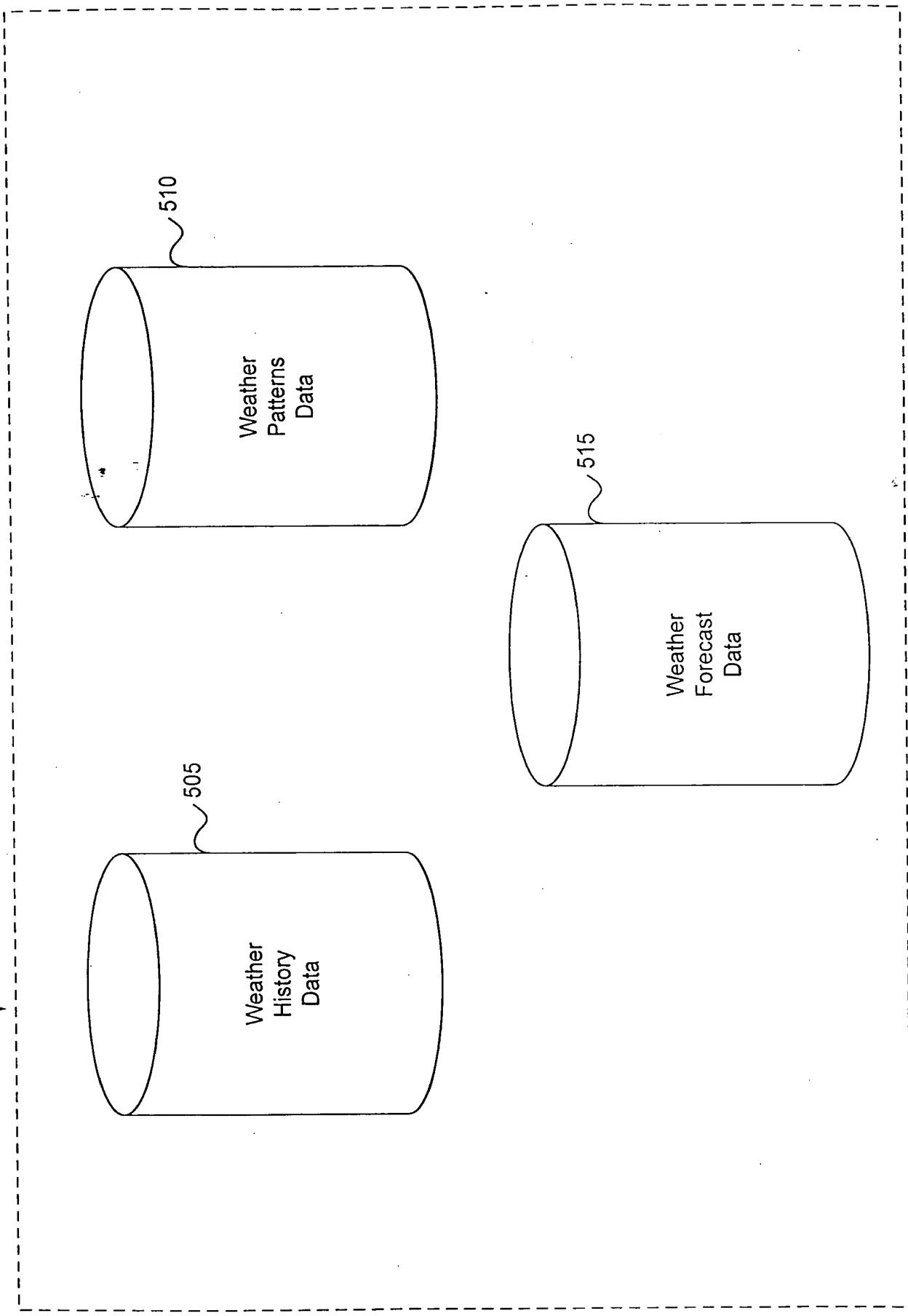


FIG. 5

Weather History Data 505

610

615

605

622

Year	MA	Data Type	Period1	Period2	Period3	Period4	Period5	Period6
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
1997	MA100	temp_sea	46	47	50	51	49	47
1998	MA100	temp_sea	46	47	49	51	50	48
1997	MA100	prec_sea	1.01	1.03	1.08	1.1	1.12	1.1
1998	MA100	prec_sea	1.01	1.03	1.07	1.1	1.12	1.1
1997	MA100	wind_speed_sea	17	15	5	7	10	14
1998	MA100	wind_speed_sea	16	15	4	7	10	13
1997	MA100	solar_radiation_sea	3.4	4.1	4.2	5.5	4.3	3.8
1998	MA100	solar_radiation_sea	3.4	4.0	4.2	5.4	4.0	3.7
1997	MA100	cloud_cover_sea	75	75	25	25	25	75
1998	MA100	cloud_cover_sea	75	75	25	25	25	75
1997	MA100	cooling_rate_sea	0.2	0.3	0.2	0.2	0.2	0.1
1998	MA100	cooling_rate_sea	0.3	0.3	0.2	0.2	0.2	0.2
1997	MA100	growing_degree_days_sea	24	25	25	21	19	16
1998	MA100	growing_degree_days_sea	24	26	25	21	19	16
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮

FIG. 6A

Weather History Data 505

605 } 610 } 615 } 620 }

Year	MA	Data Type	Period6					
			Period5	Period4	Period3	Period2	Period1	
1997	MA100	temp	49	43	45	47	50	42
1998	MA100	temp	53	51	56	50	58	54
1997	MA100	prec	1.5	0.4	0.9	1.3	1.7	0.3
1998	MA100	prec	1.1	0.01	2.68	1.78	0.48	0.01
1997	MA100	wind_speed	15	14	5	7	16	20
1998	MA100	wind_speed	12	15	10	8	18	21
1997	MA100	solar_radiation	3.0	4.1	4.0	5.2	4.3	4.0
1998	MA100	solar_radiation_sea	3.4	4.0	4.5	5.4	4.0	3.7
1997	MA100	cloud_cover	100	75	25	25	25	0
1998	MA100	cloud_cover	75	75	25	25	25	25
1997	MA100	cooling_rate	0.3	0.3	0.2	0.2	0.2	0.1
1998	MA100	cooling_rate	0.3	0.3	0.2	0.2	0.2	0.2
1997	MA100	growing_degree_days	26	27	25	25	19	16
1998	MA100	growing_degree_days	23	26	25	20	19	15
:	:	:	:	:	:	:	:	:

FIG. 6B

Weather History Data 505

620

615

610

605

Year	MA	Data Type	Period1	Period2	Period3	Period4	Period5	Period6
1997	MA100	temp.cat	1	-1	-1	1	1	-1
1998	MA100	temp.cat	1	1	-1	1	1	1
1997	MA100	prec.cat	1	-1	-1	1	1	-1
1998	MA100	prec.cat	1	-1	1	1	-1	-1
1997	MA100	wind_speed.cat	-1	-1	0	0	1	1
1998	MA100	wind_speed.cat	-1	0	1	1	1	1
1997	MA100	solar_radiation.cat	-1	0	-1	-1	0	1
1998	MA100	solar_radiation.cat	0	0	-1	0	0	0
1997	MA100	cloud_cover.cat	1	0	0	0	0	-1
1998	MA100	cloud_cover.cat	0	0	0	0	0	-1
1997	MA100	cooling_rate.cat	1	0	0	0	0	0
1998	MA100	cooling_rate.cat	0	0	0	0	0	0
1997	MA100	growing_degree_days.cat	1	1	0	1	0	0
1998	MA100	growing_degree_days.cat	-1	0	0	-1	0	-1
:	:	:	:	:	:	:	:	:

FIG. 6C

- TEMPERATURE/PRECIPITATION
 - SEASONAL/SEASONAL
 - SEASONAL/ABOVE SEASONAL
 - SEASONAL/BELOW SEASONAL
 - ABOVE SEASONAL/SEASONAL
 - ABOVE SEASONAL/ABOVE SEASONAL
 - ABOVE SEASONAL/BELOW SEASONAL
 - BELOW SEASONAL/SEASONAL
 - BELOW SEASONAL/ABOVE SEASONAL
 - BELOW SEASONAL/BELOW SEASONAL
- TEMPERATURE/SOLAR RADIATION
 - SEASONAL/SEASONAL
 - SEASONAL/ABOVE SEASONAL
 - SEASONAL/BELOW SEASONAL
 - ABOVE SEASONAL/SEASONAL
 - ABOVE SEASONAL/ABOVE SEASONAL
 - ABOVE SEASONAL/BELOW SEASONAL
 - BELOW SEASONAL/SEASONAL
 - BELOW SEASONAL/ABOVE SEASONAL
 - BELOW SEASONAL/BELOW SEASONAL
- CLOUD COVER/SOLAR RADIATION
 - SEASONAL/SEASONAL
 - SEASONAL/ABOVE SEASONAL
 - SEASONAL/BELOW SEASONAL
 - ABOVE SEASONAL/SEASONAL
 - ABOVE SEASONAL/ABOVE SEASONAL
 - ABOVE SEASONAL/BELOW SEASONAL
 - BELOW SEASONAL/SEASONAL
 - BELOW SEASONAL/ABOVE SEASONAL
 - BELOW SEASONAL/BELOW SEASONAL
- COOLING RATE/SOLAR RADIATION
 - SEASONAL/SEASONAL
 - SEASONAL/ABOVE SEASONAL
 - SEASONAL/BELOW SEASONAL
 - ABOVE SEASONAL/SEASONAL
 - ABOVE SEASONAL/ABOVE SEASONAL
 - ABOVE SEASONAL/BELOW SEASONAL
 - BELOW SEASONAL/SEASONAL
 - BELOW SEASONAL/ABOVE SEASONAL
 - BELOW SEASONAL/BELOW SEASONAL
- PRECIPITATION/WIND SPEED
 - SEASONAL/SEASONAL
 - SEASONAL/ABOVE SEASONAL
 - SEASONAL/BELOW SEASONAL
 - ABOVE SEASONAL/SEASONAL
 - ABOVE SEASONAL/ABOVE SEASONAL
 - ABOVE SEASONAL/BELOW SEASONAL
 - BELOW SEASONAL/SEASONAL
 - BELOW SEASONAL/ABOVE SEASONAL
 - BELOW SEASONAL/BELOW SEASONAL

FIG. 7A

SUSTAINED WEATHER

- TEMPERATURE SUSTAINED 2 PERIODS
- TEMPERATURE SUSTAINED 3 PERIODS
- PRECIPITATION SUSTAINED 2 PERIODS
- PRECIPITATION SUSTAINED 3 PERIODS
- WIND SPEED SUSTAINED 2 PERIODS
- WIND SPEED SUSTAINED 3 PERIODS
- SOLAR RADIATION SUSTAINED 2 PERIODS
- SOLAR RADIATION SUSTAINED 3 PERIODS
- CLOUD COVER SUSTAINED 2 PERIODS
- CLOUD COVER SUSTAINED 3 PERIODS
- COOLING RATE SUSTAINED 2 PERIODS
- COOLING RATE SUSTAINED 3 PERIODS
- GROWING DEGREE DAYS SUSTAINED 2 PERIODS
- GROWING DEGREE DAYS SUSTAINED 3 PERIODS

● TEMPERATURE/PRECIPITATION LAG 1 PERIOD

- SEASONAL/SEASONAL
- SEASONAL/ABOVE SEASONAL
- SEASONAL/BELOW SEASONAL
- ABOVE SEASONAL/SEASONAL
- ABOVE SEASONAL/ABOVE SEASONAL
- ABOVE SEASONAL/BELOW SEASONAL
- BELOW SEASONAL/SEASONAL
- BELOW SEASONAL/ABOVE SEASONAL
- BELOW SEASONAL/BELOW SEASONAL

● TEMPERATURE/SOLAR RADIATION LAG 1 PERIOD

- SEASONAL/SEASONAL
- SEASONAL/ABOVE SEASONAL
- SEASONAL/BELOW SEASONAL
- ABOVE SEASONAL/SEASONAL
- ABOVE SEASONAL/ABOVE SEASONAL
- ABOVE SEASONAL/BELOW SEASONAL
- BELOW SEASONAL/SEASONAL
- BELOW SEASONAL/ABOVE SEASONAL
- BELOW SEASONAL/BELOW SEASONAL

● CLOUD COVER/SOLAR RADIATION LAG 1 PERIOD

- SEASONAL/SEASONAL
- SEASONAL/ABOVE SEASONAL
- SEASONAL/BELOW SEASONAL
- ABOVE SEASONAL/SEASONAL
- ABOVE SEASONAL/ABOVE SEASONAL
- ABOVE SEASONAL/BELOW SEASONAL
- BELOW SEASONAL/SEASONAL
- BELOW SEASONAL/ABOVE SEASONAL
- BELOW SEASONAL/BELOW SEASONAL

⋮

FIG. 7B

Weather Forecast Data 515

Year	MA	Data Type	Period1	Period2	Period3	Period4	Period5	Period6
N+1	MA100	temp_sea	47	47	49	52	54	55
N+1	MA100	prec_sea	1.00	1.03	1.06	1.05	1.10	1.1
N+1	MA100	wind_speed_sea	18	14	5	7	11	15
N+1	MA100	solar_radiation_sea	3.4	4.1	4.2	5.4	4.2	3.7
N+1	MA100	cloud_cover_sea	75	75	25	0	25	75
N+1	MA100	cooling_rate_sea	?	?	?	?	?	?
N+1	MA100	growing_degree_days_sea	24	27	27	25	20	17
:	:	:	:	:	:	:	:	:
N+1	MA100	temp	48	49	50	53	55	57
N+1	MA100	prec	1.1	1.05	1.05	1.00	1.15	1.2
N+1	MA100	wind_speed	16	16	7	5	16	20
N+1	MA100	solar_radiation	3.5	4.5	4.5	5.5	5.0	4.3
N+1	MA100	cloud_cover	75	25	75	25	0	25
N+1	MA100	cooling_rate	0.2	0.3	0.2	0.2	0.2	0.2
N+1	MA100	growing_degree_days	24	28	26	22	20	16
:	:	:	:	:	:	:	:	:

FIG. 8A

Weather Forecast Data 515

Year	MA	Data Type
N+1	MA100	temp.cat
N+1	MA100	prec.cat
N+1	MA100	wind_speed.cat
N+1	MA100	solar_radiation.cat
N+1	MA100	cloud_cover.cat
N+1	MA100	cooling_rate.cat
N+1	MA100	growing_degree_days.cat
:	:	:

FIG. 8B

Year	Reservoir	MA	Description of Watershed	Recorded Problems						Attempted Solutions						Uses (%)							
				955	960	965	970	975	980	985	987	989	990	991	992	993	994	995	996	997	998	999	
Reservoir/Watershed History Database 410																							
991																							
1997	R1	MA 100	945	950	955	960	965	970	975	980	985	987	989	990	991	992	993	994	995	996	997	998	
1998	R1	MA 100	950	955	960	965	970	975	980	985	987	989	990	991	992	993	994	995	996	997	998	999	
1997	R2	MA 101	950	955	960	965	970	975	980	985	987	989	990	991	992	993	994	995	996	997	998	999	
1998	R2	MA 101	950	955	960	965	970	975	980	985	987	989	990	991	992	993	994	995	996	997	998	999	
1997	R3	MA 135	950	955	960	965	970	975	980	985	987	989	990	991	992	993	994	995	996	997	998	999	
1998	R3	MA 135	950	955	960	965	970	975	980	985	987	989	990	991	992	993	994	995	996	997	998	999	
...	

9906-74.vsd/8

FIG. 9

Problems Database 415

புது தொழில் தொடர்பு துறை முனிசிபல் குழுமம்

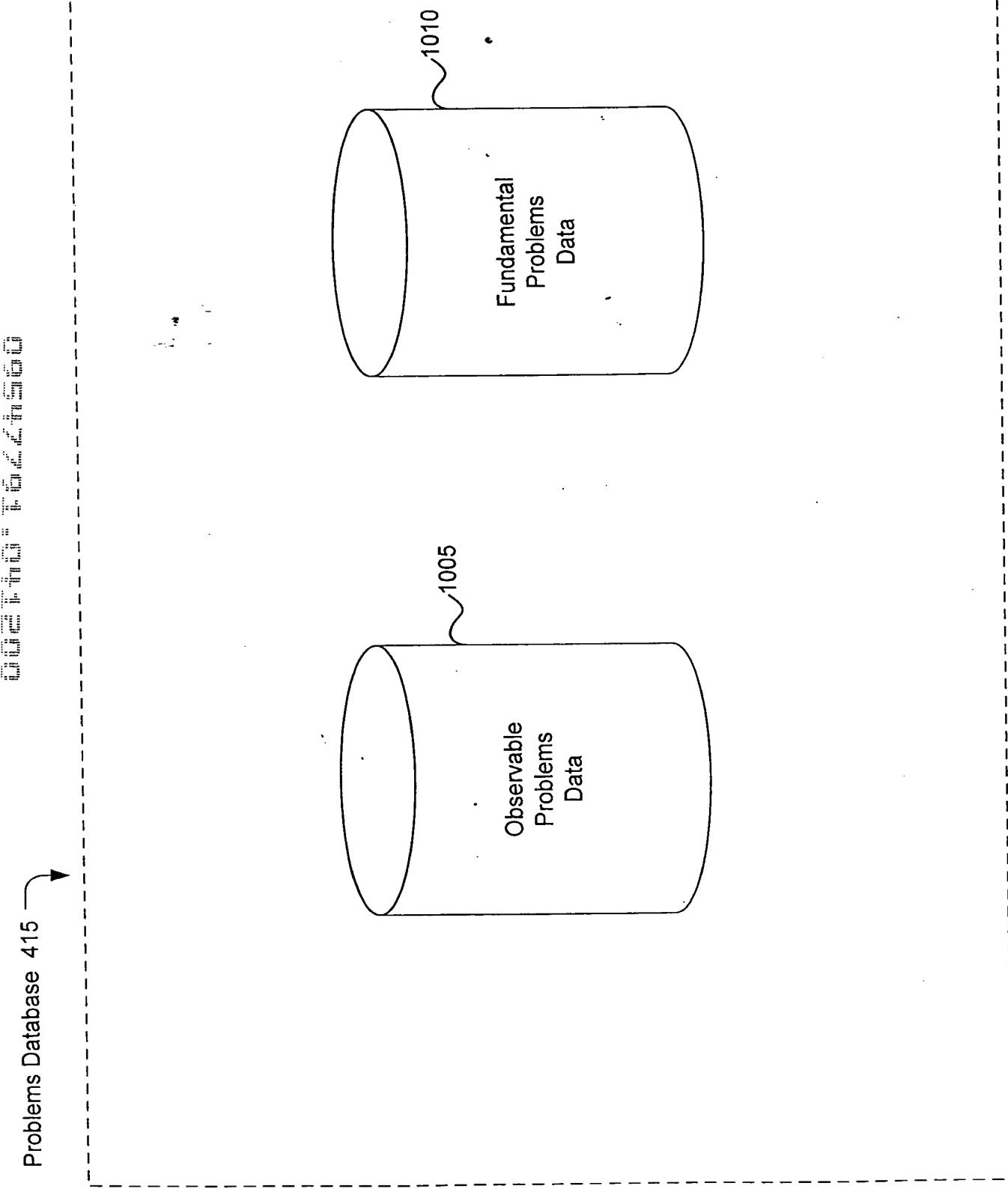


FIG. 10

9906-70.vsd/3

Observable Problems Data 1005

Observable Problem	Description	Related Fundamental/Observable Problems
OP1	Objectionable Taste and Odor Conditions	OP3, OP6, FP2, FP3, FP4
OP2	Declining Wildlife (e.g., fish)	OP5, OP6, OP8, FP3, FP4
OP3	Shallow Water	FP3
OP4	Decreased Water Clarity	FP3, FP4
OP5	Decreased Water Flow	FP3, FP4
OP6	Excessive Plant Growth	FP1, FP4
:	:	:

FIG. 11

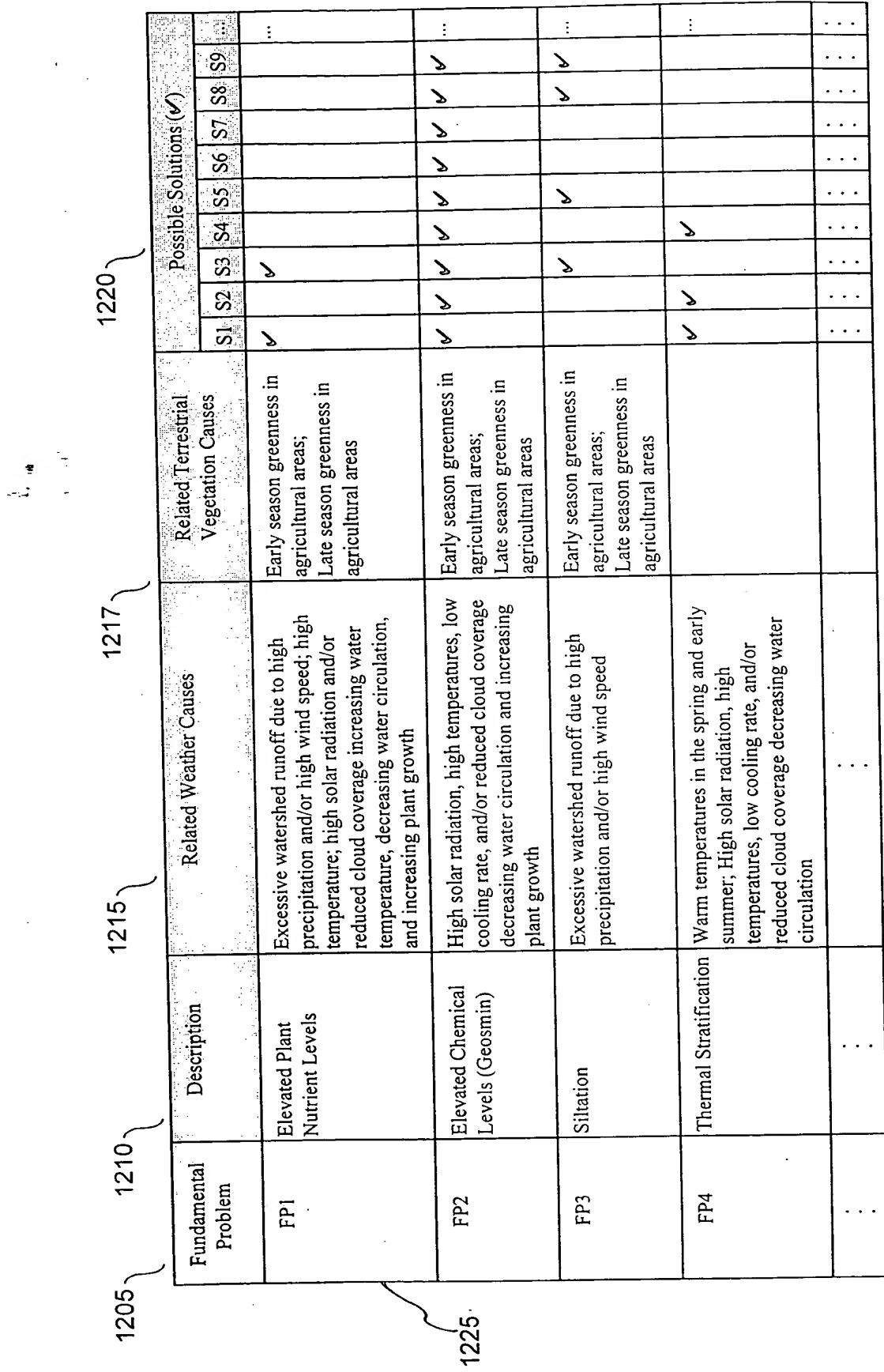


FIG. 12

Solutions Database 420

Type of Solution	Solution	Description	Term	Economic Impact	Political Impact	Environmental Impact
Physical	S1	Adjust Water Level	short	low	high	medium
	S2	Cut Weeds	short	medium	low	low
	S3	Dredge	long	high	low	low
	S4	Aeration (Destratification)	short	medium	low	low
	S5	Alter Adjacent Land Use	long	high	high	high
Chemical	S6	Disinfect (Water Treatment)	long	high	low	low
	S7	Filter (Water Treatment)	long	high	low	low
	S8	Apply different types of fertilizer to crops	short	low	high	medium
	S9	Apply fertilizer at time sensitive times relating to terrestrial greenness	short	low	high	low
	S10	Introduce Herbicides	short	medium	high	high
Biological	S11	Introduce Fish	long	medium	low	low
	:	:	:	:	:	:

1305 } 1310 } 1315 } 1320 } 1325 } 1330 } 1335 }

1340

FIG. 13

Terrestrial Vegetation Database 425

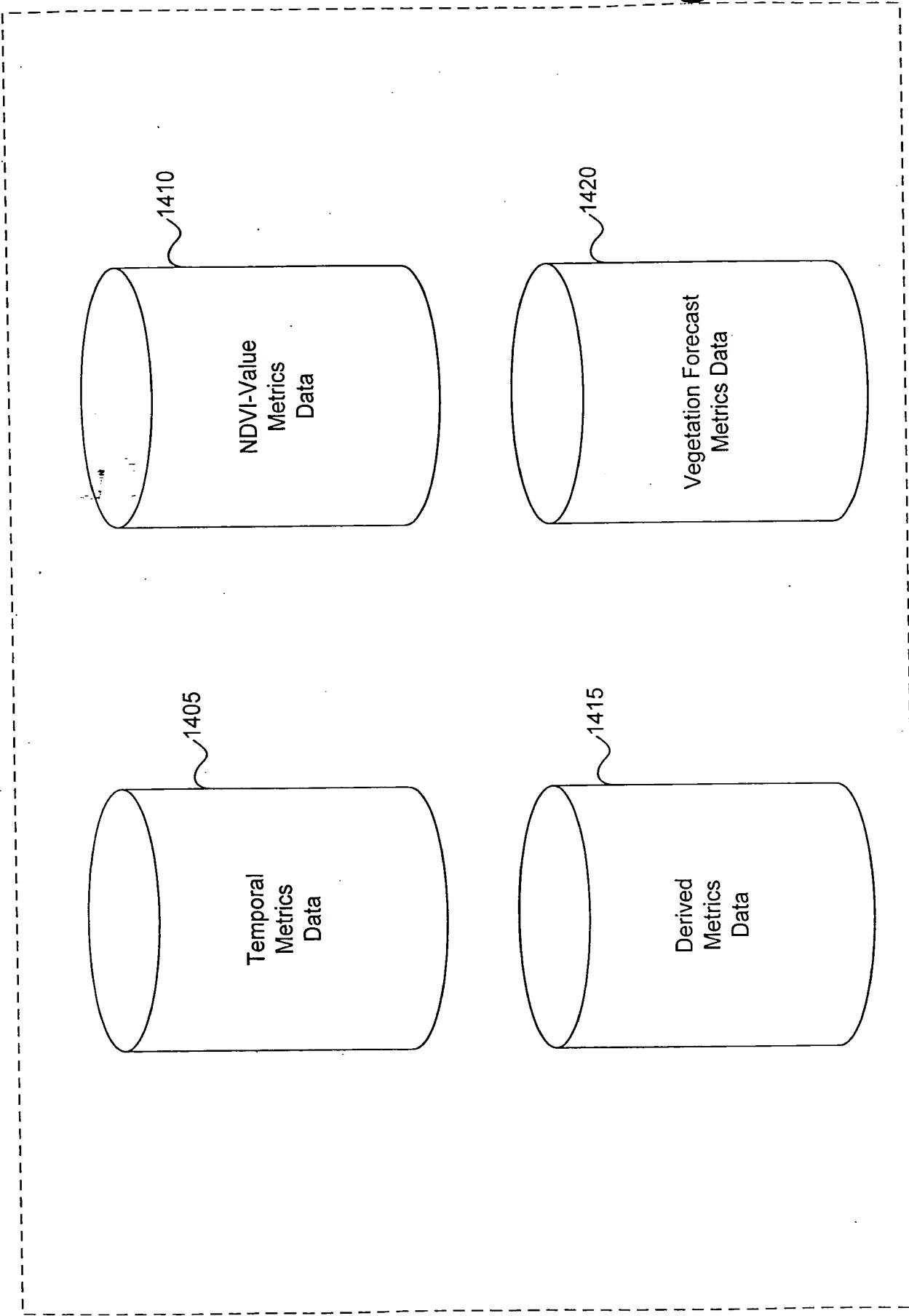


FIG. 14

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Temporal Metrics Data 1405

Year	MA	Temporal Metrics		Duration of Greenness	Time of Maximum Greenness				
		1505	1510	1515	1520	1525			
1997	MA100	80	81	80	88	86	81	25025525260245250170174172162159169185184190177185187	1530
1997	MA101	92	93	101	101	100	95	251250251249245250159157150148145189183182180189189	1535
1998	MA101	101	101	115	115	103	97	245250250246245250144149135131142153185186180189191190	1540
1998	MA101	101	101	115	115	103	97	245250250246245250144149135131142153185186180189191190	1545
1998	MA101	101	101	115	115	103	97	245250250246245250144149135131142153185186180189191190	1550
1998	MA101	101	101	115	115	103	97	245250250246245250144149135131142153185186180189191190	1555
1998	MA101	101	101	115	115	103	97	245250250246245250144149135131142153185186180189191190	1560
1998	MA101	101	101	115	115	103	97	245250250246245250144149135131142153185186180189191190	1565
1998	MA101	101	101	115	115	103	97	245250250246245250144149135131142153185186180189191190	1570
1998	MA101	101	101	115	115	103	97	245250250246245250144149135131142153185186180189191190	1575
1998	MA101	101	101	115	115	103	97	245250250246245250144149135131142153185186180189191190	1580
1998	MA101	101	101	115	115	103	97	245250250246245250144149135131142153185186180189191190	1585
1998	MA101	101	101	115	115	103	97	245250250246245250144149135131142153185186180189191190	1590
1998	MA101	101	101	115	115	103	97	245250250246245250144149135131142153185186180189191190	1595
1998	MA101	101	101	115	115	103	97	245250250246245250144149135131142153185186180189191190	1600

FIG. 15

NDVI-Value Metrics Data 1410

Year	MA	NDVI-Value Metrics					
		Value of Onset of Greenness 620	Value of End of Greenness 620	Maximum NDVI 620	Value of NDVI 620	Range of NDVI 620	Period6
1997	MA100	120 125 122 119 126 115 118 120 119 117 121 120 169 171 168 169 170 170 49 48 47 51 47 50					Period5
1998	MA100	115 117 120 119 125 110 120 121 120 113 120 170 170 168 165 166 166 44 47 50 50 48 47					Period4
1997	MA101	132 133 150 117 130 125 130 118 120 119 119 115 165 166 170 171 169 50 51 48 54 53 50					Period3
1998	MA101	145 151 130 120 125 125 135 119 125 120 126 16 169 170 170 171 169 170 48 51 53 53 48 50					Period2
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮

1630
1635

FIG. 16

Derived Metrics Data 1415 →

Year	MA	Derived Metrics									
		Accumulated NDVI 620			Rate of Green-up 620						
1710			1715			1720			1725		
Period1	Period2	Period3	Period4	Period5	Period6	Period1	Period2	Period3	Period4	Period5	Period6
1997	MA100	1600	1600	1620	1625	1600	2.2	2.1	2.0	2.0	-1.7
1998	MA100	1620	1590	1600	1550	1600	2.2	2.2	2.0	2.0	-1.9
1997	MA100	1560	1570	1590	1600	1590	2.0	2.2	1.9	2.0	-1.7
1998	MA100	1590	1600	1610	1590	1600	2.0	2.1	2.0	2.1	-1.8
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
1730	1735	1730	1735	1730	1735	1730	1735	1730	1735	1730	1735
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
1705	1710	1715	1720	1725	1730	1735	1740	1745	1750	1755	1760
Mean Daily NDVI 620	Mean Daily NDVI 620	Mean Daily NDVI 620	Mean Daily NDVI 620	Mean Daily NDVI 620	Mean Daily NDVI 620	Mean Daily NDVI 620	Mean Daily NDVI 620	Mean Daily NDVI 620	Mean Daily NDVI 620	Mean Daily NDVI 620	Mean Daily NDVI 620

FIG. 17

Vegetation Forecast Metrics Data 1420



Year	MA	Temporal Metrics						NDVI-Value Metrics						Derived Metrics										
		Time of Onset of Greenness	Time of End of Greenness	Duration of Greenness	Time of Maximum Greenness	Value of Onset of Greenness	Value of End of Greenness	Value of Maximum NDVI	NDVI	Range of NDVI	Accumulated NDVI	Rate of Green-up	Rate of Senescence	Mean Daily NDVI	Mean Daily NDVI	Mean Daily NDVI	Mean Daily NDVI							
1805								
N+1	MA100	75	80	251	250	170	170	185	191	120	122	120	170	50	49	1610	1550	2.1	2.0	-1.8	-1.8	150	145	
N+1	MA101	92	90	250	250	171	172	190	190	120	121	119	120	170	49	46	1600	1600	2.0	2.0	-1.7	-1.8	150	150
1810		

FIG. 18

Government Compliance Database 430

Type	State/Locality	MA(s) Applicable	Permit Required for Solution (✓)						
			S1	S2	S3	S4	S5	S6	S7
Federal	—	MA100 - MA1780						✓	✓
State	Alabama	MA201 - MA215	✓	✓	✓	✓	✓	✓	...
	Alaska	MA100 - MA109	✓	✓	✓	✓	✓	✓	...
	Arkansas	MA390 - MA415	✓	✓	✓	✓	✓	✓	✓
	:	:	:	:	:	:
Local	Allegheny County, PA	MA129	✓	✓	✓	✓	✓	✓	...
	Awency County, MD	MA909		✓	✓	✓	✓	✓	...
	Buck County, PA	MA128	✓	✓	✓	✓	✓	✓	...
	:	:	:

FIG. 19

Background Modules 315

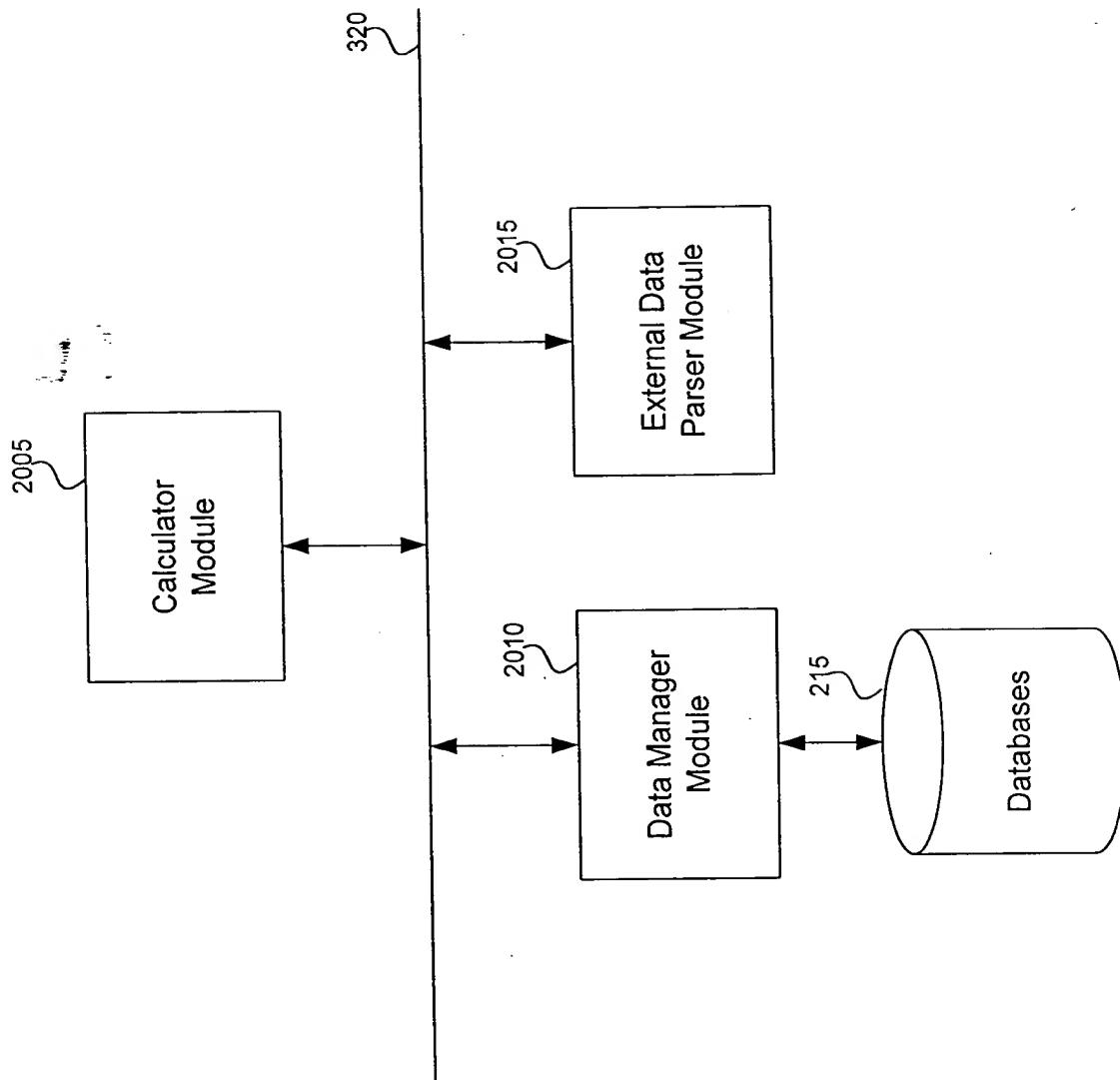


FIG. 20

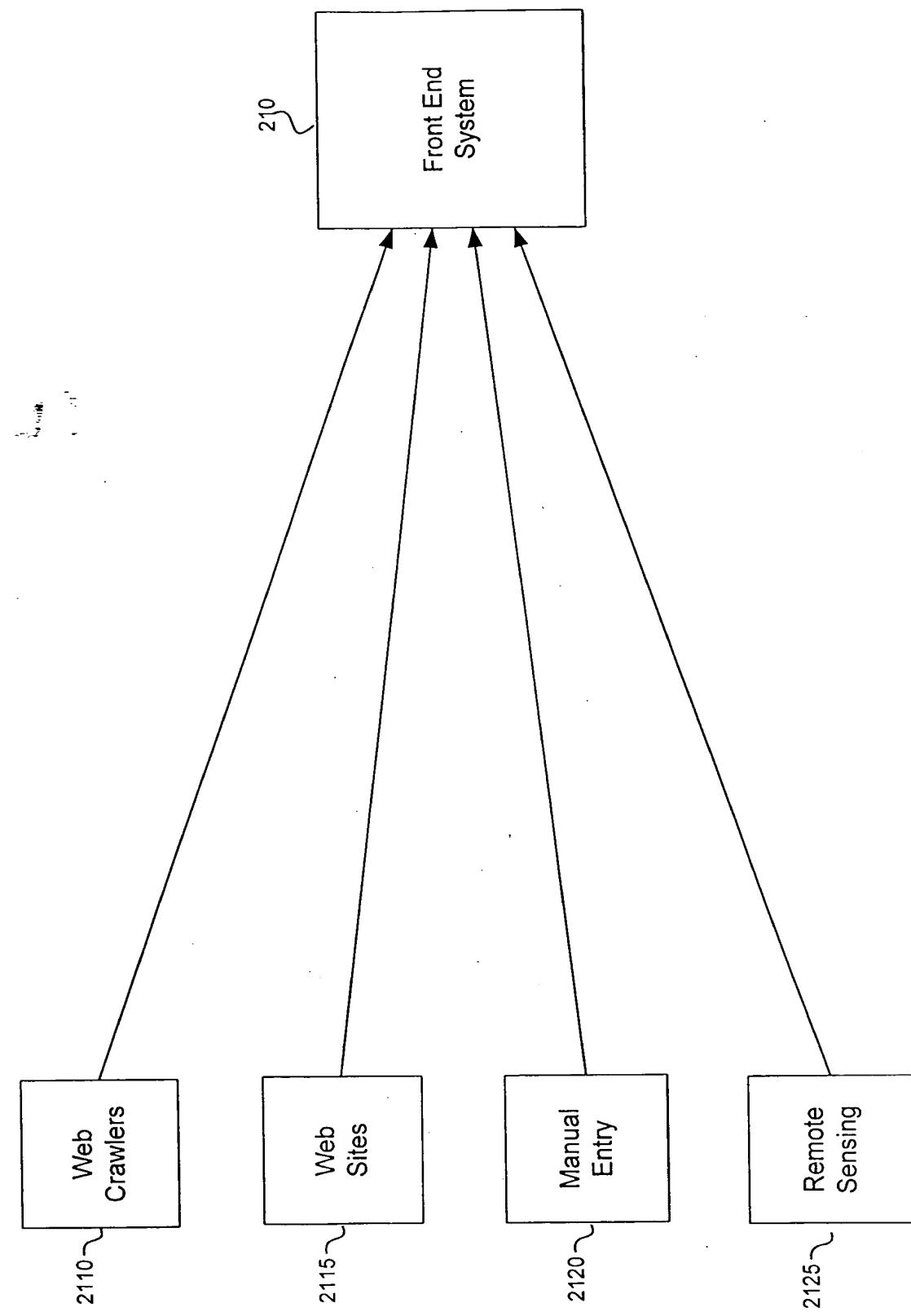


FIG. 21

Processing Modules 305

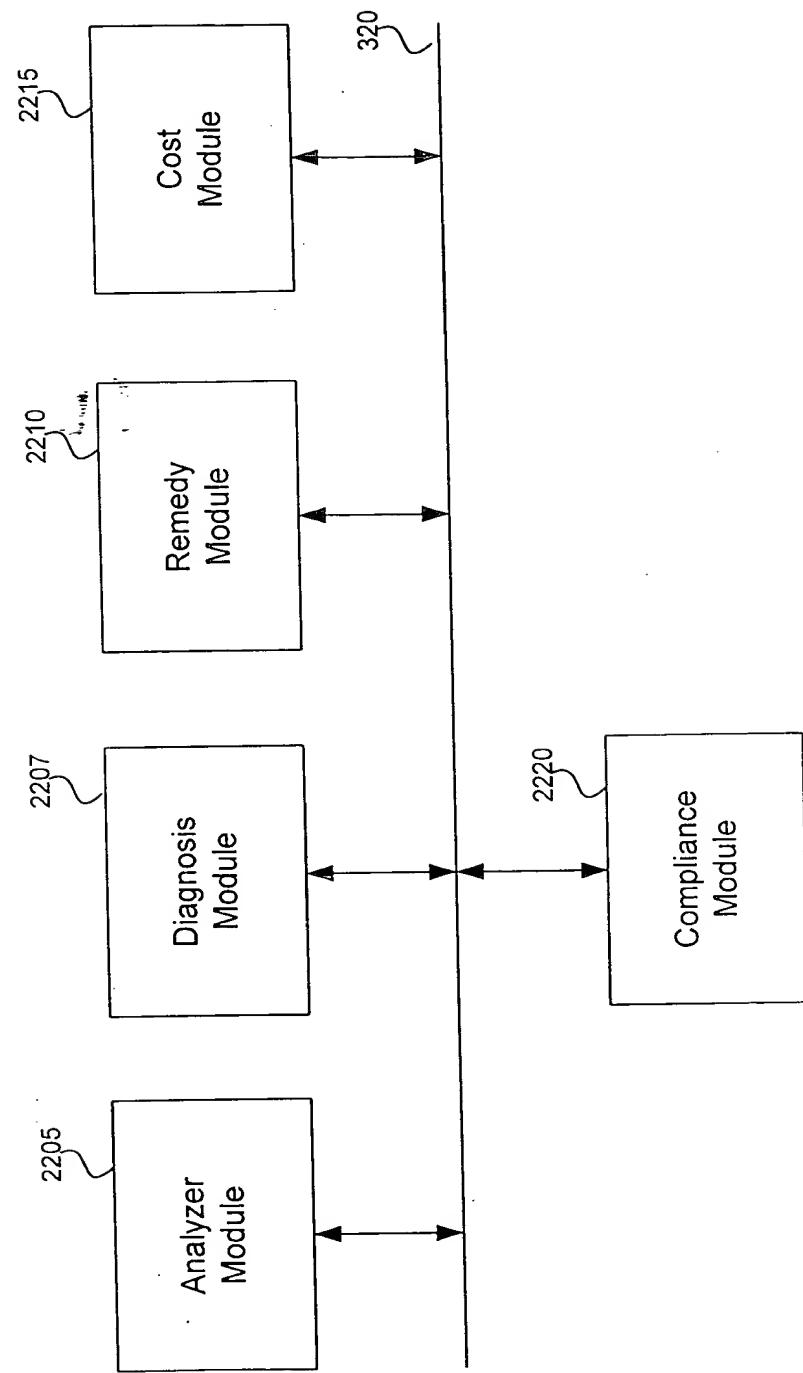


FIG. 22

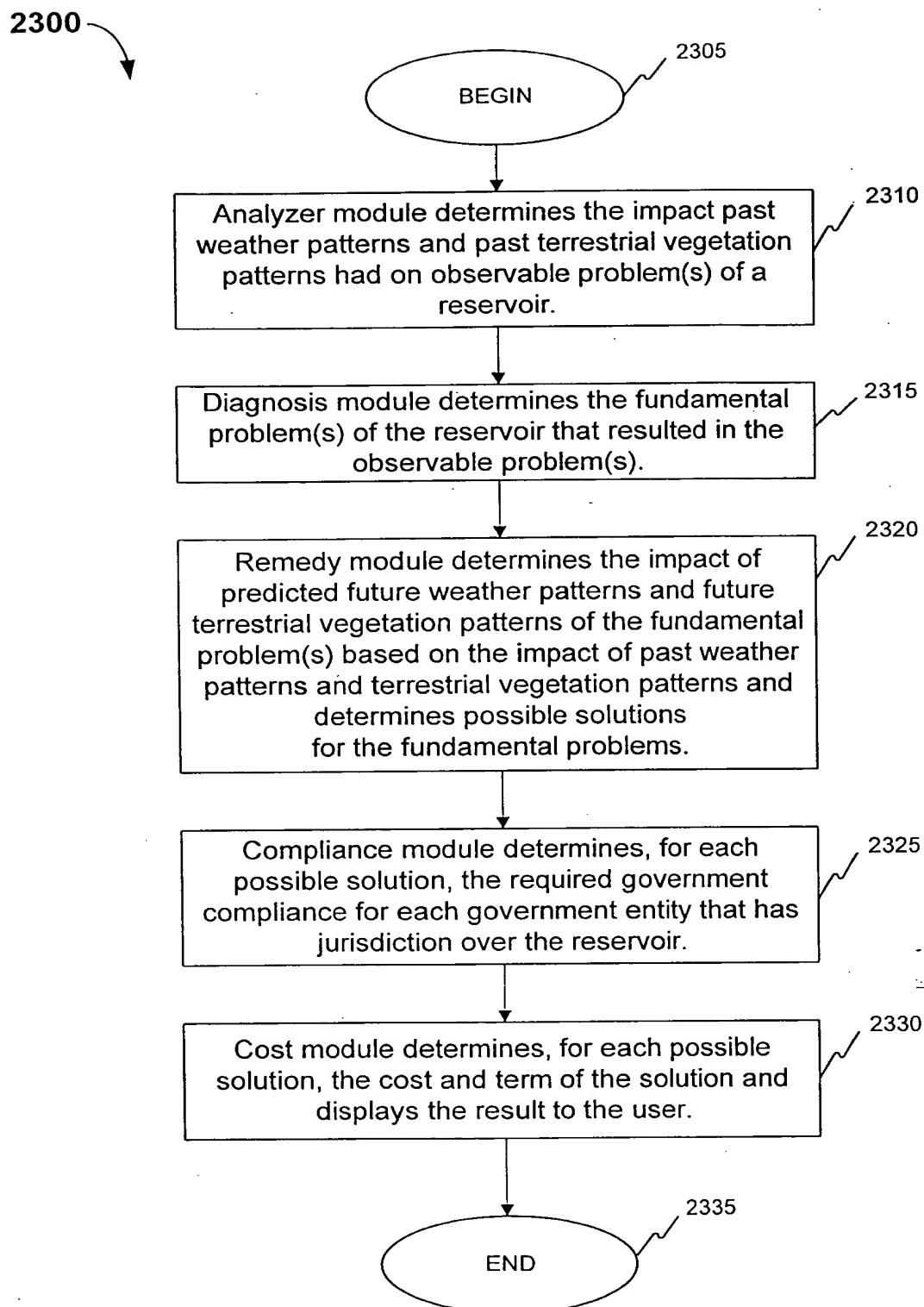


FIG. 23

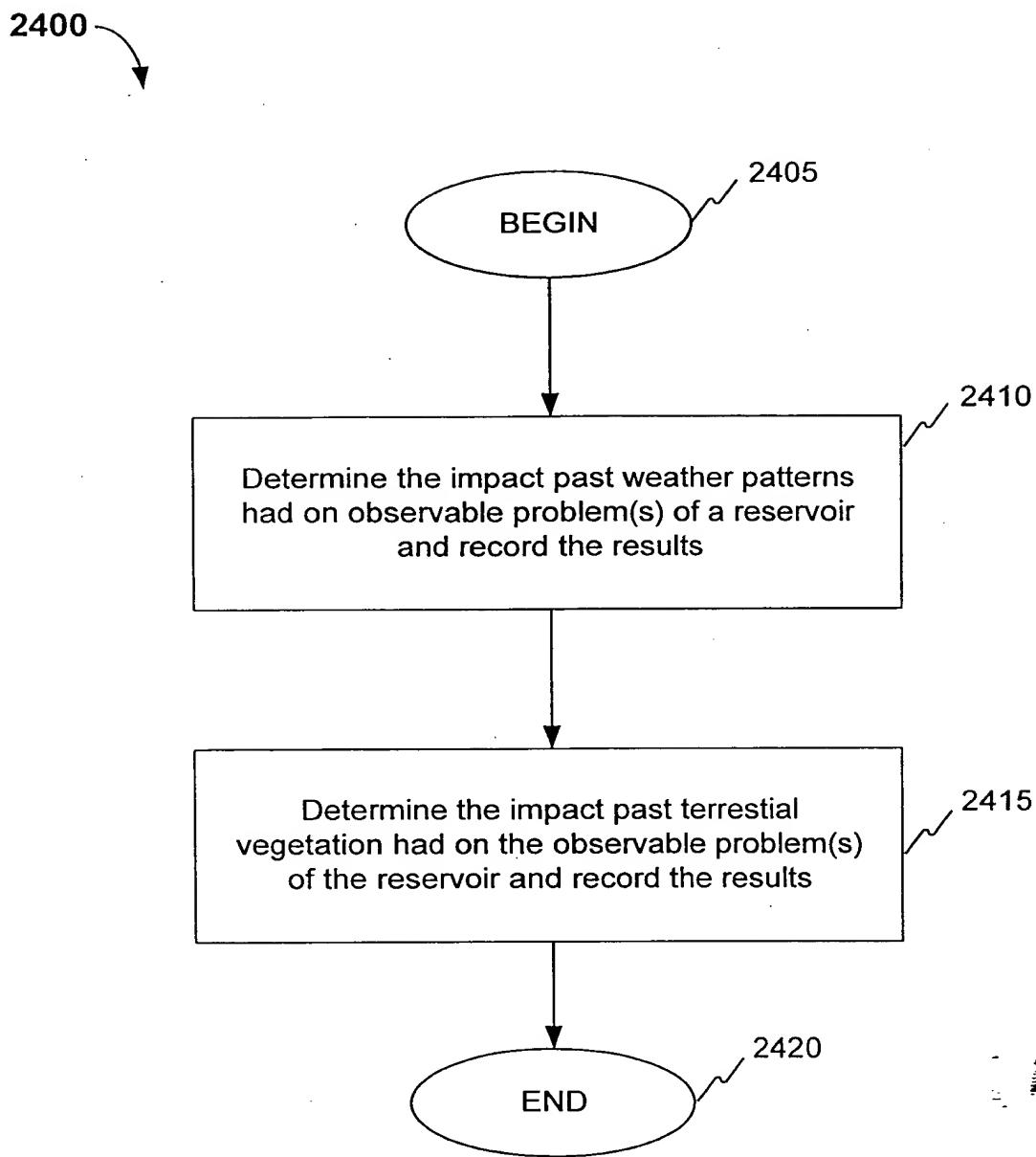


FIG. 24

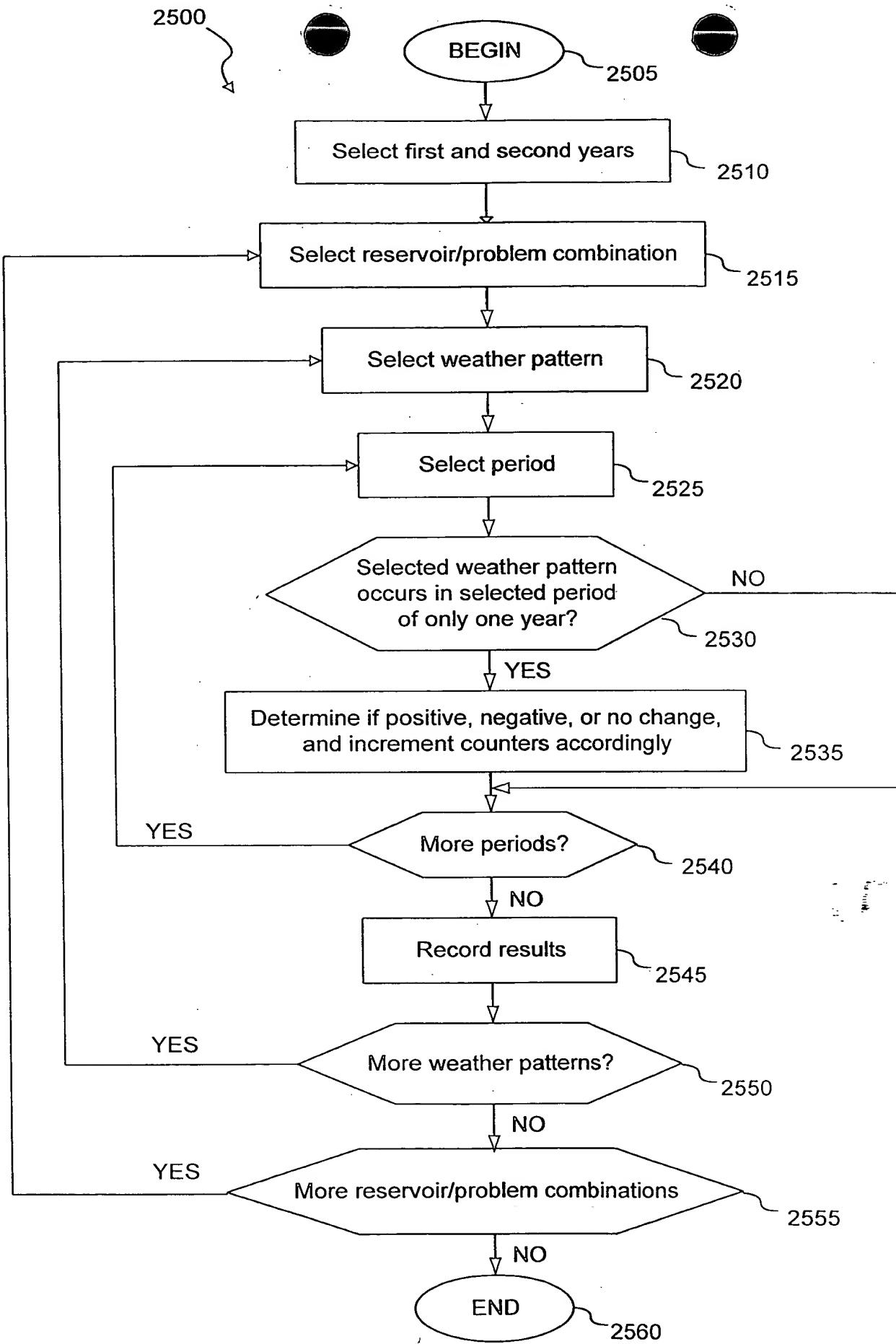


FIG. 25

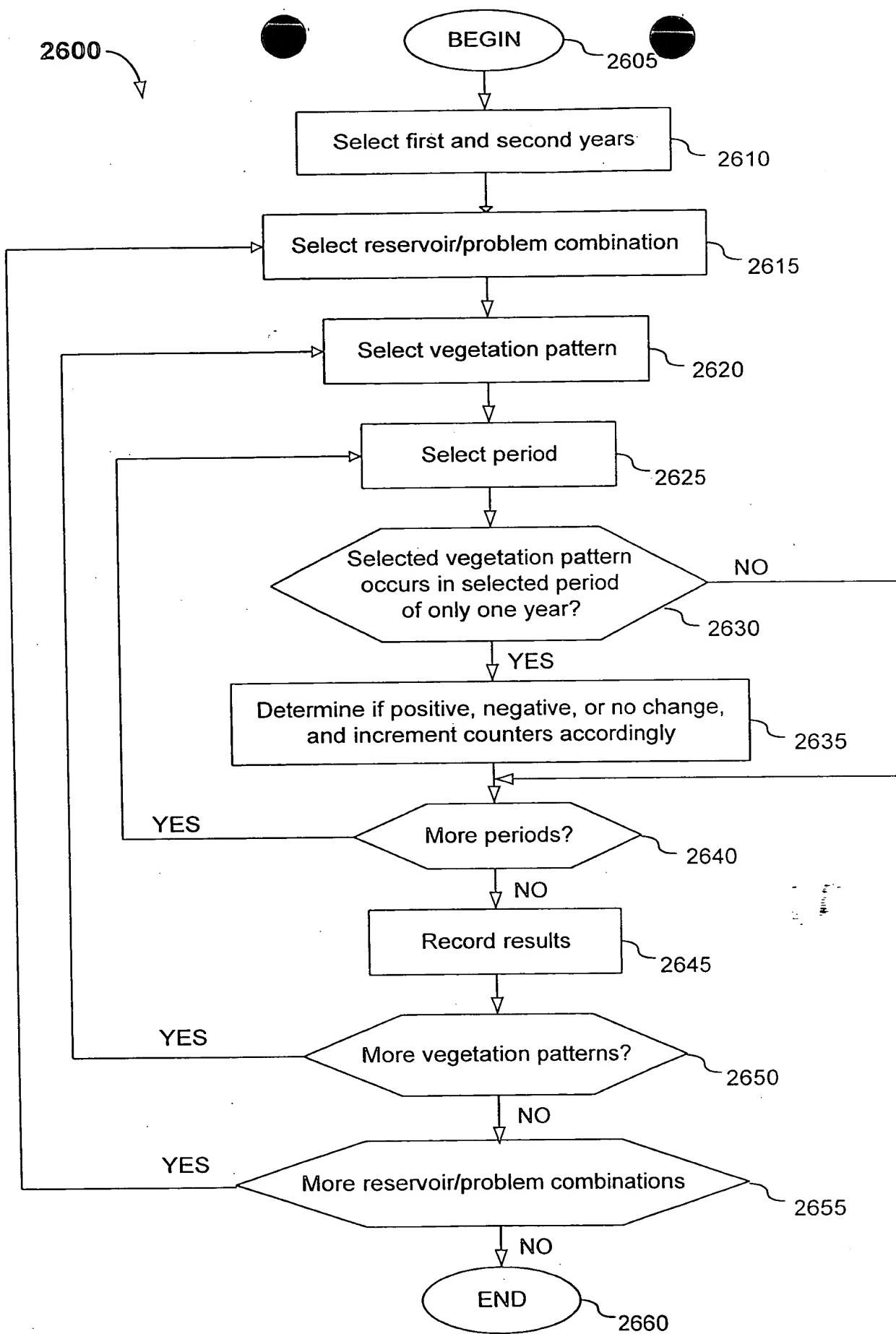


FIG. 26

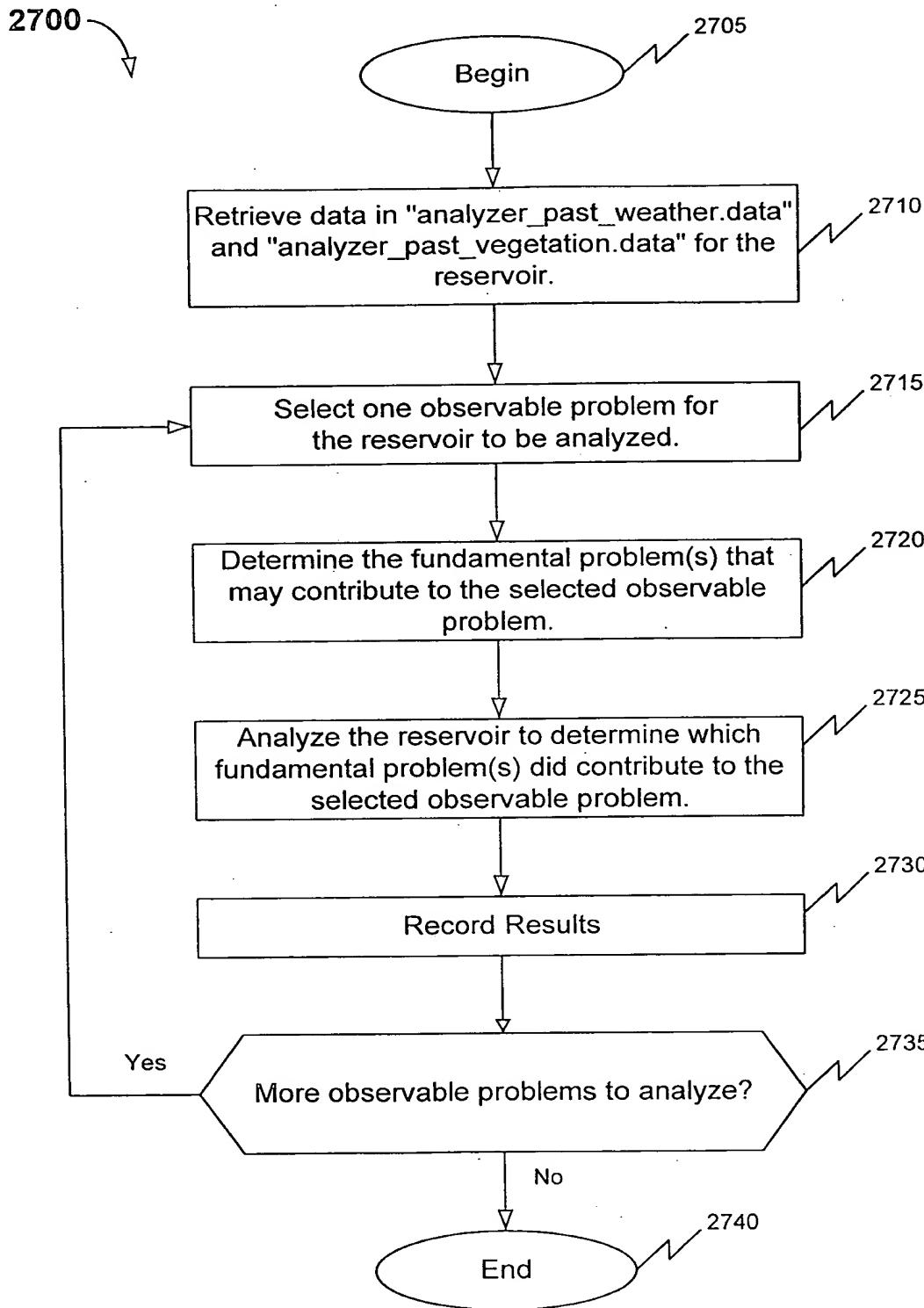


FIG. 27

2800

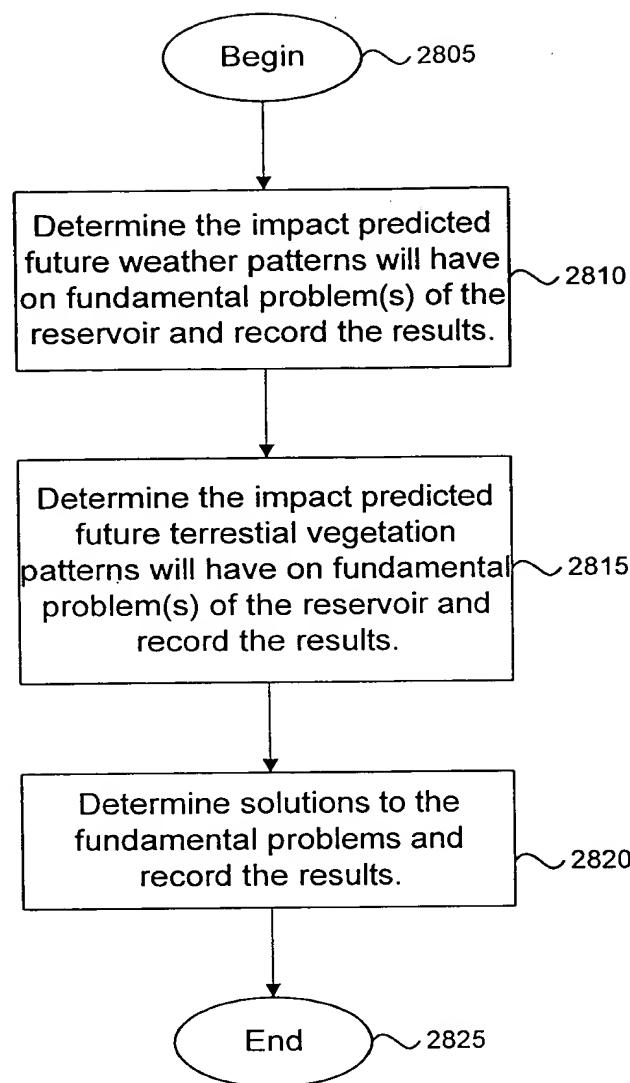


FIG. 28

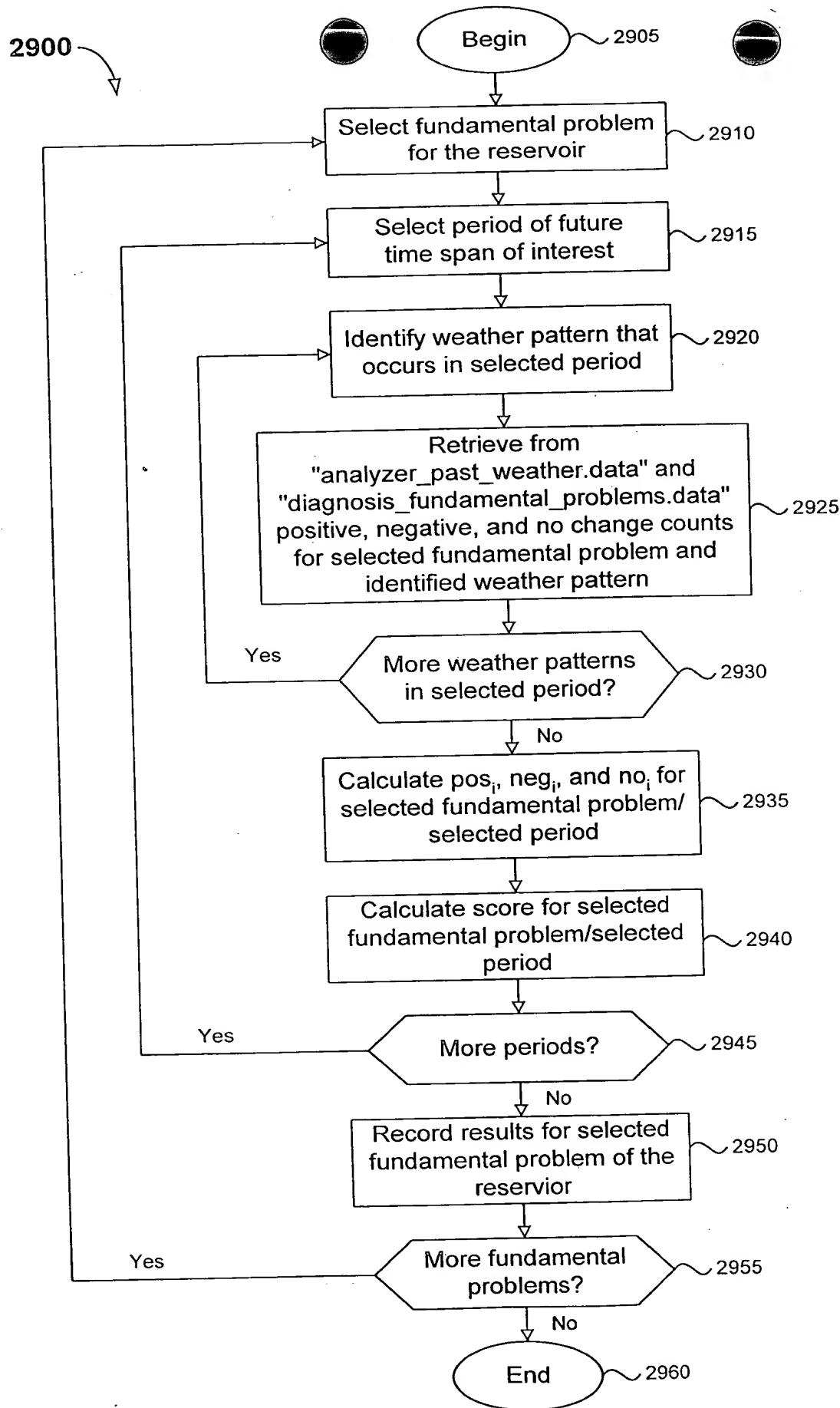


FIG. 29

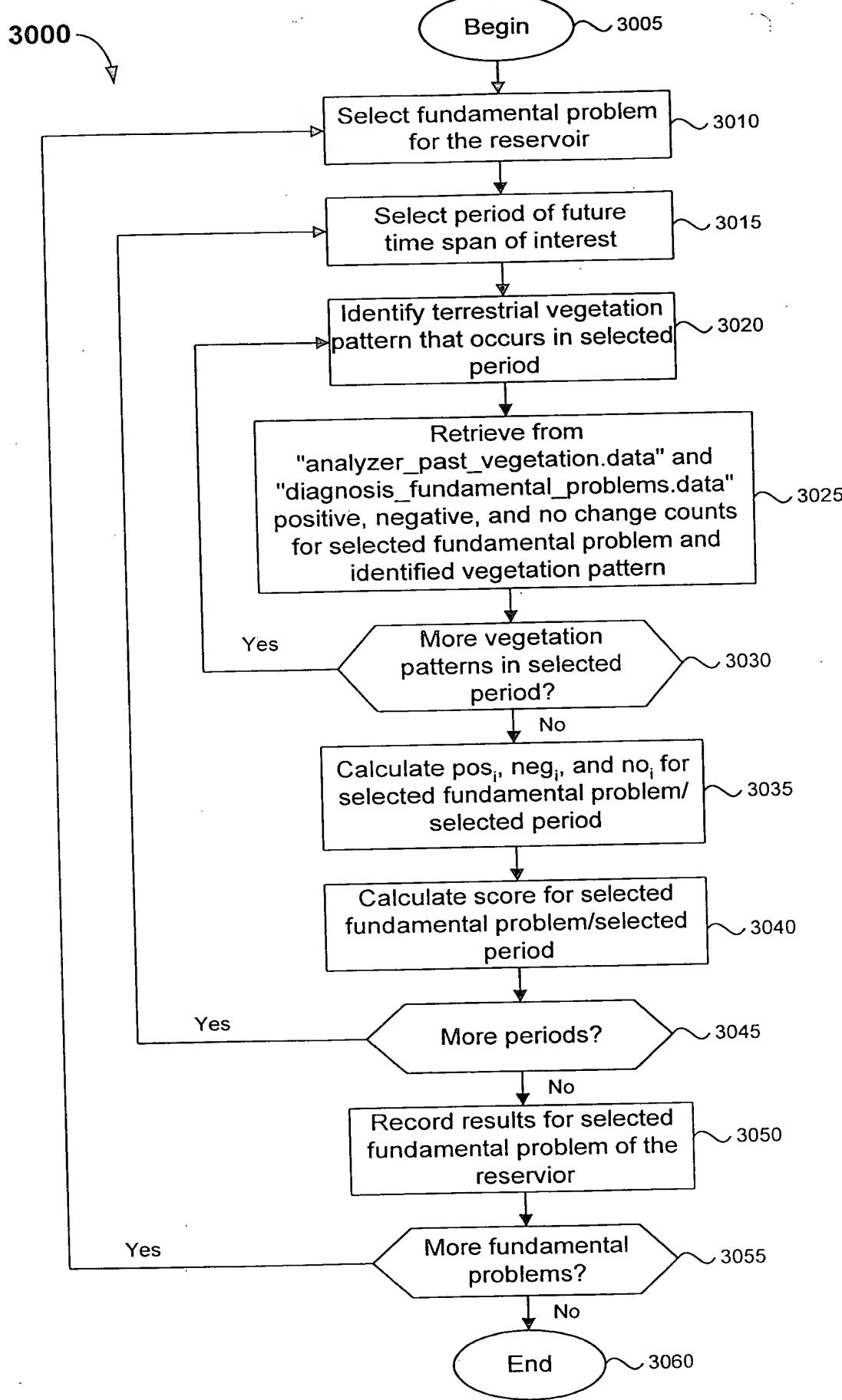


FIG. 30

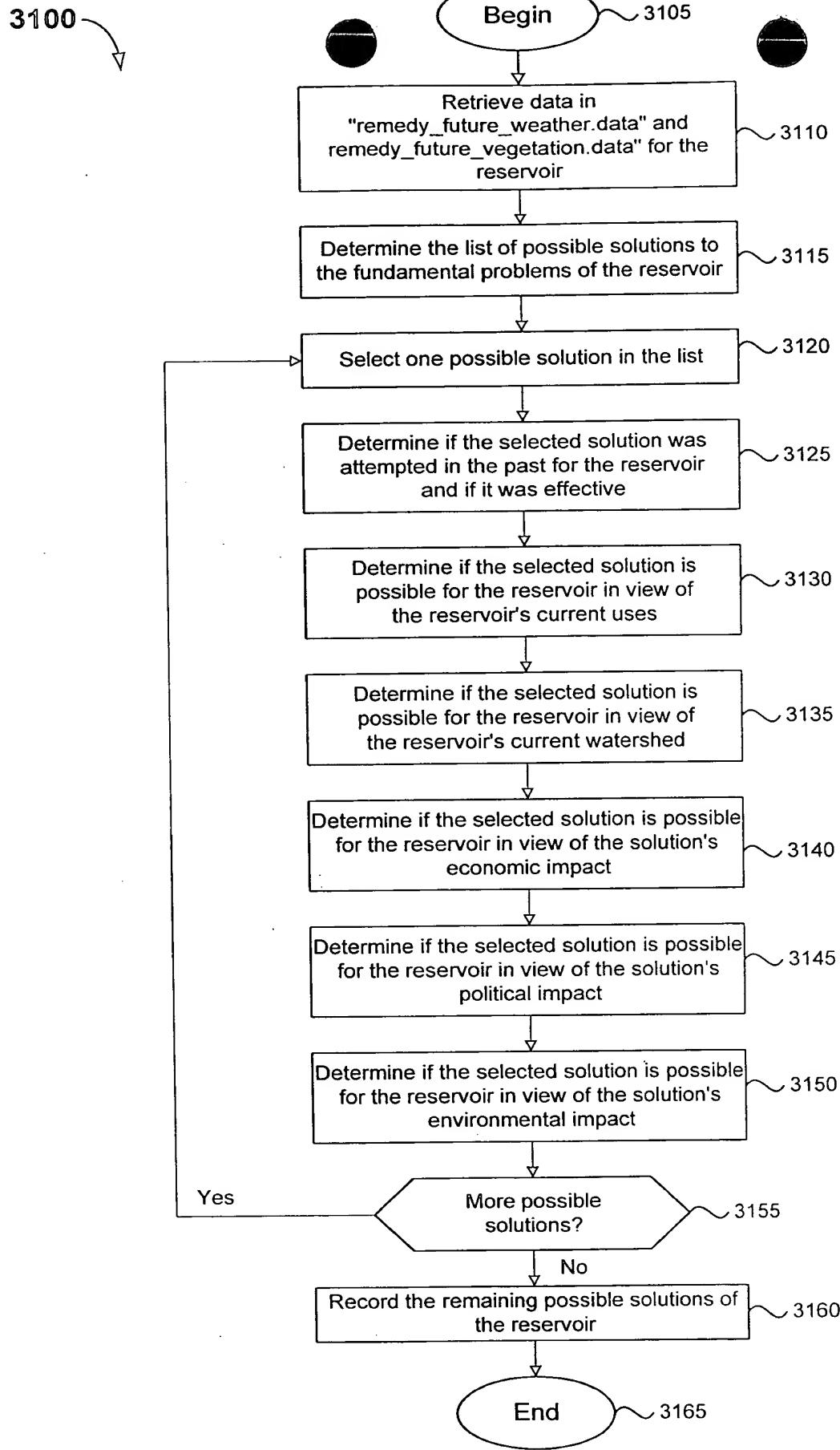


FIG. 31

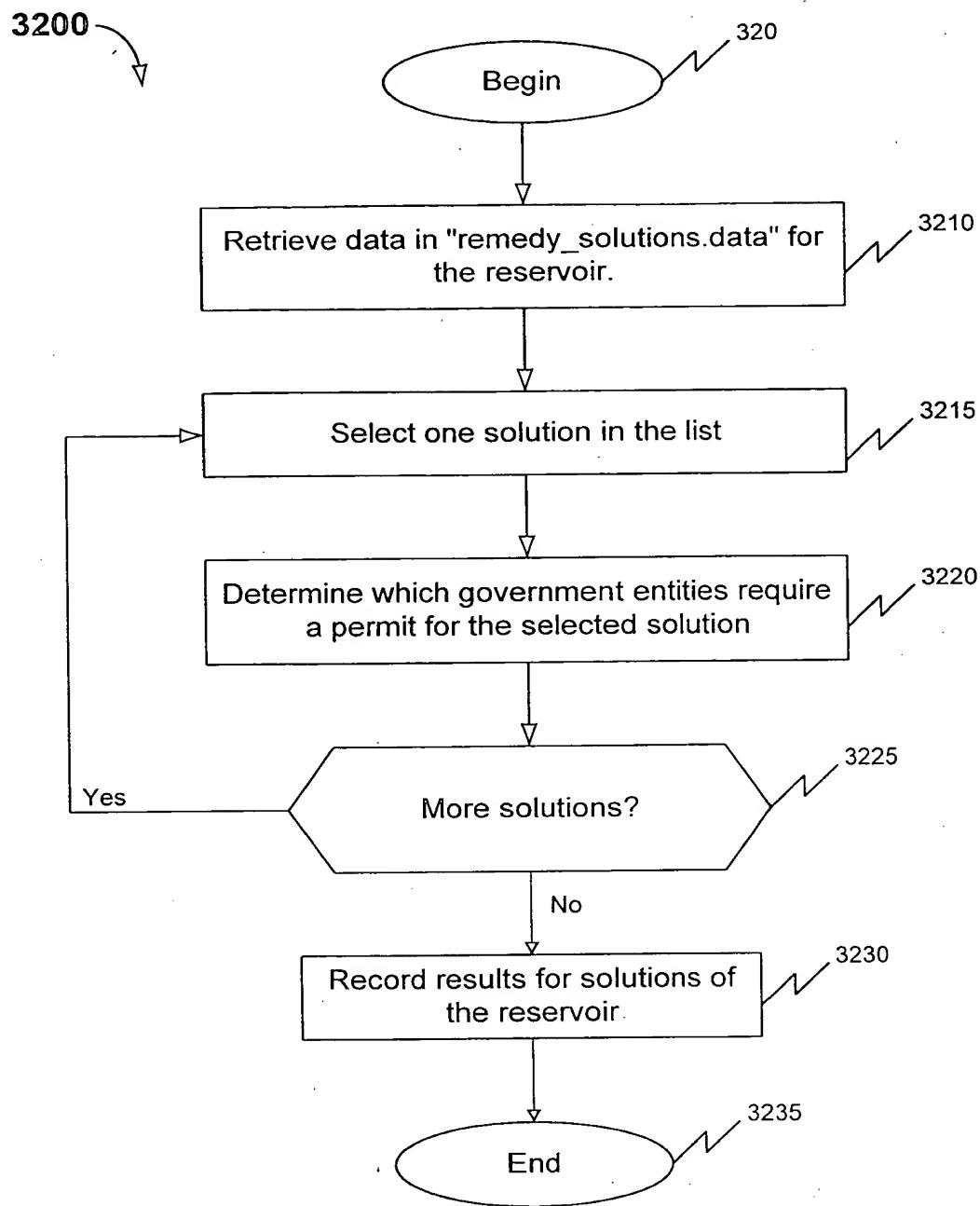


FIG. 32

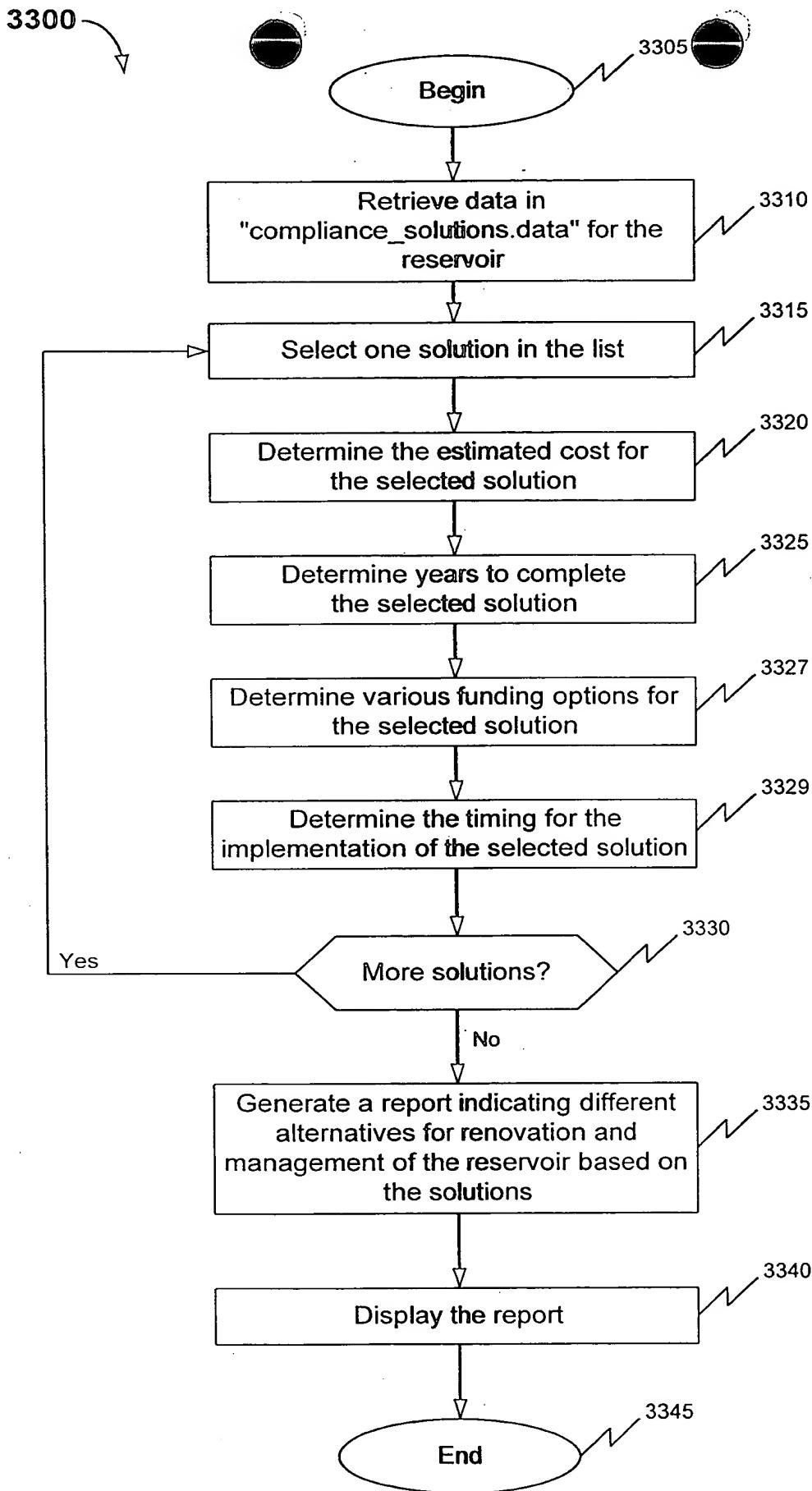


FIG. 33

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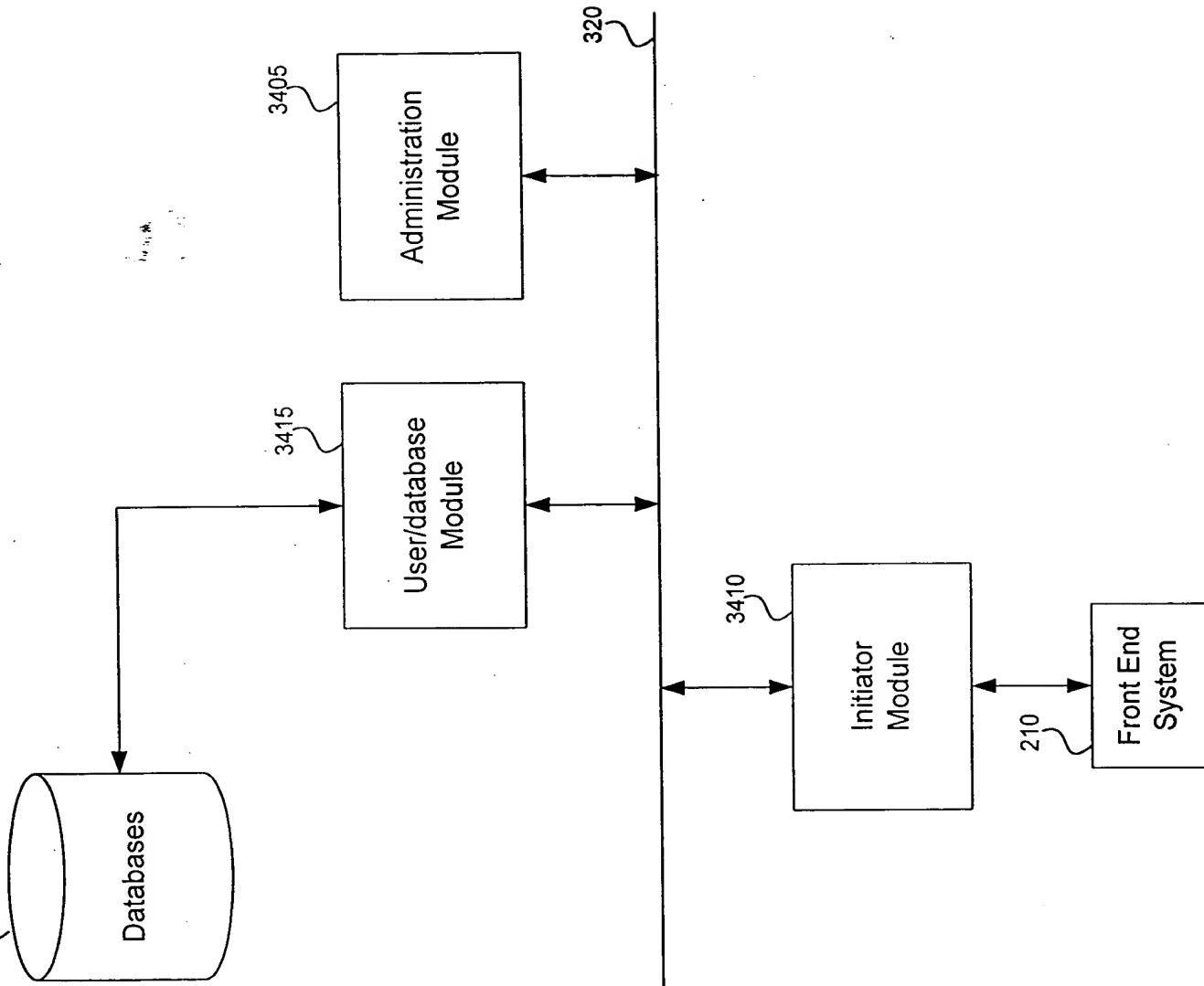


FIG. 34

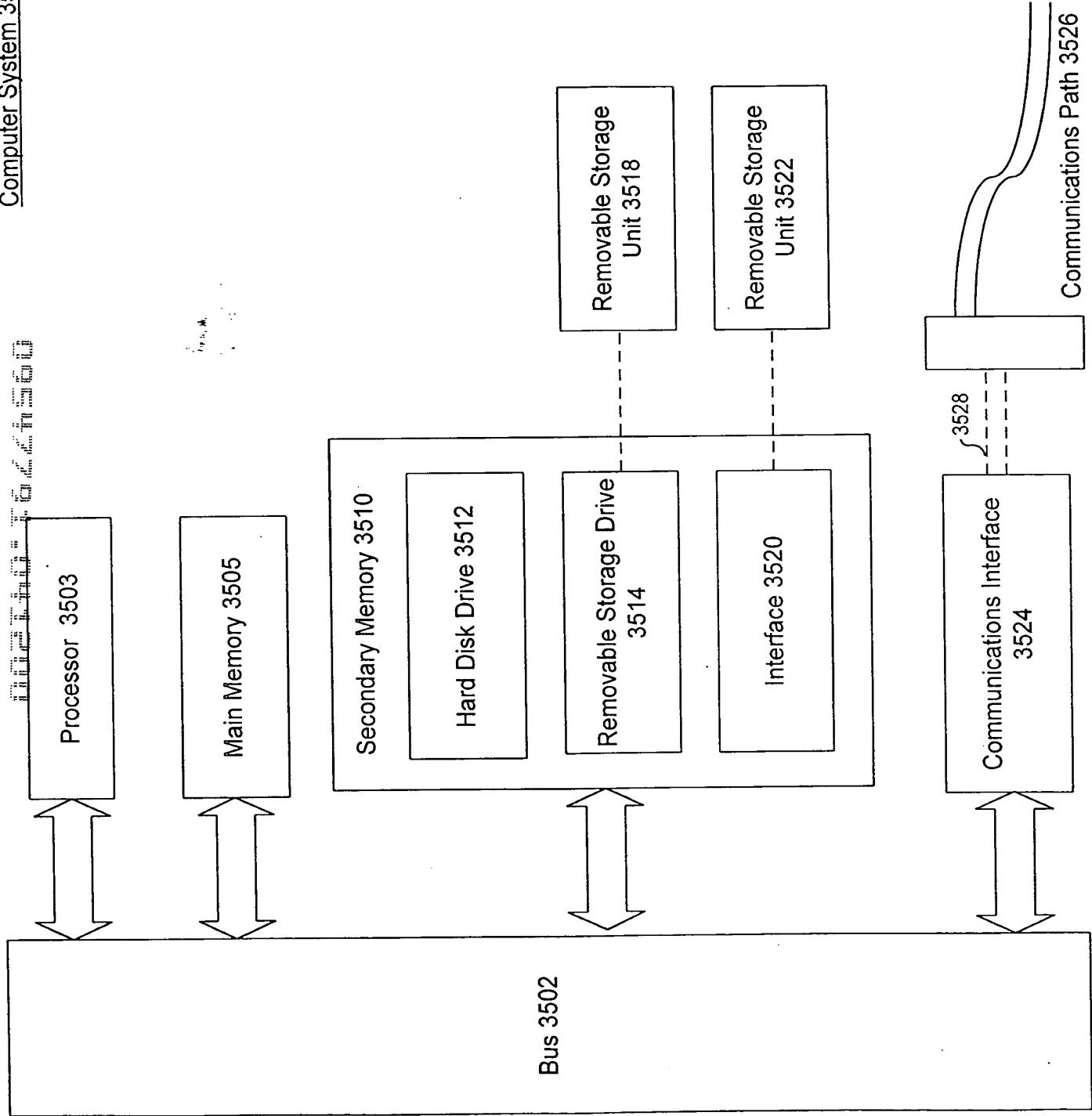


FIG. 35

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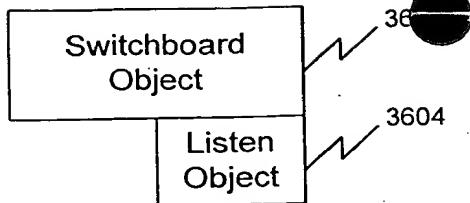


FIG. 36A

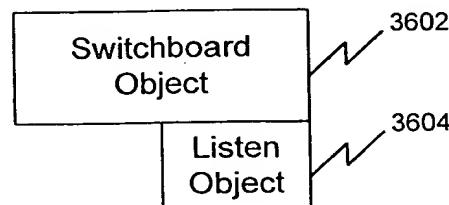


FIG. 36B

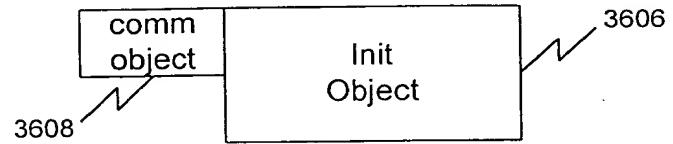
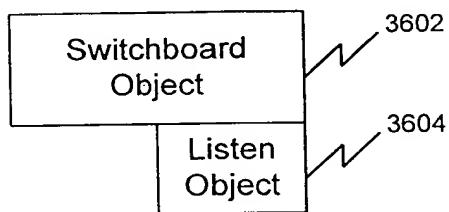
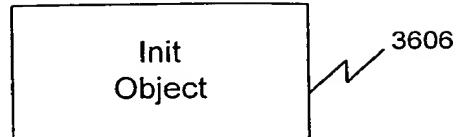


FIG. 36C

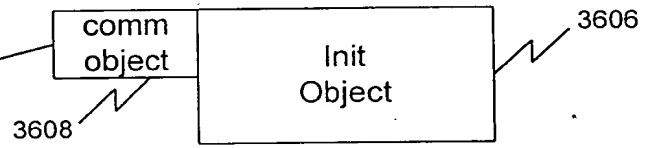
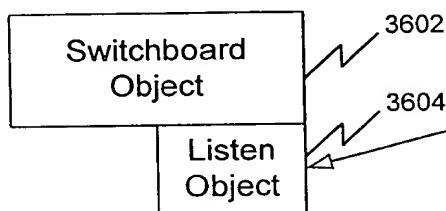


FIG. 36D

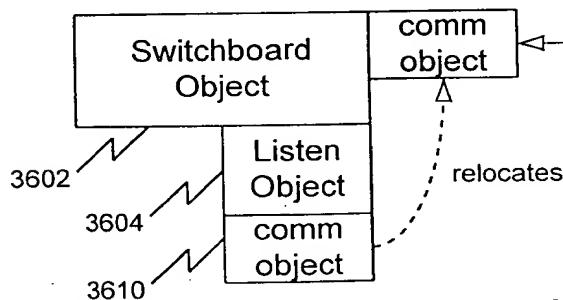


FIG. 36E

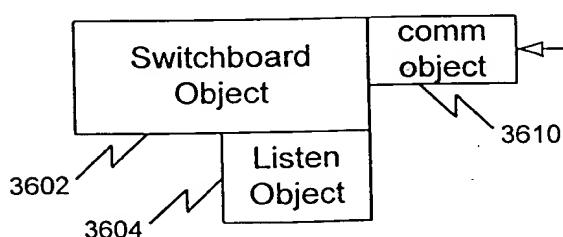
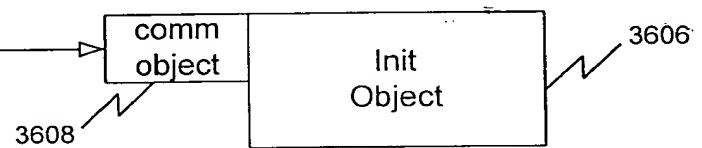
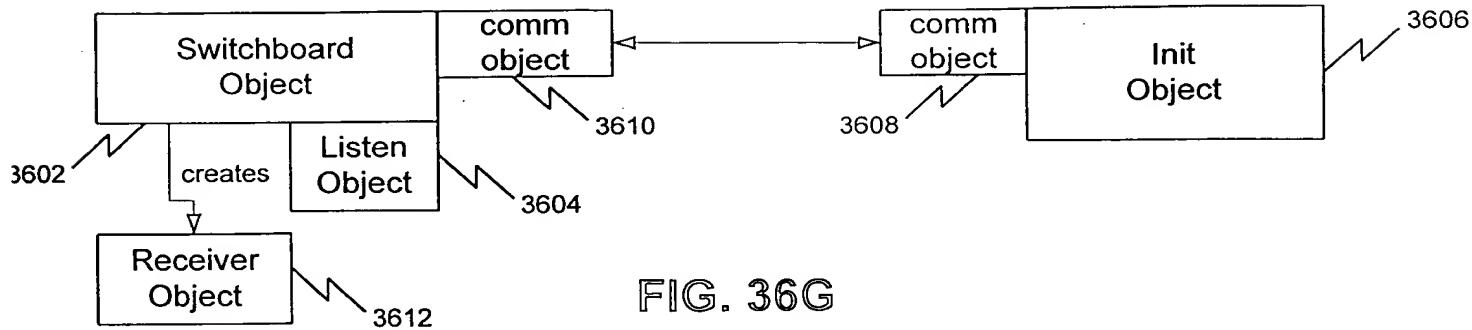
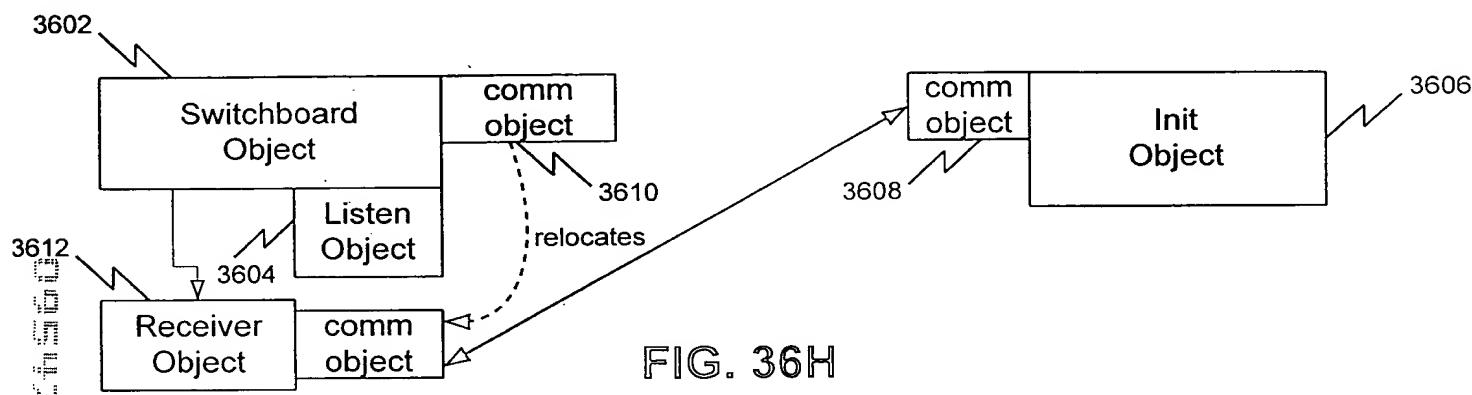
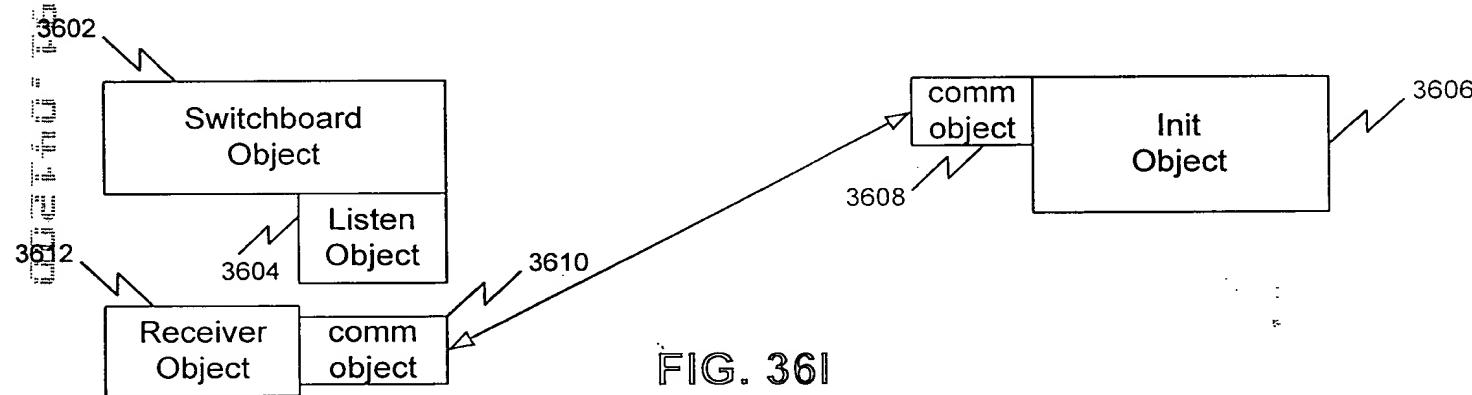


FIG. 36F

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